olivetti

Technical Service Department

OLIVETTI PRAXIS 48

Provisional Edition

To Remove RH knob from Editor 2 Remove dime size chrome Disc from Center of RH knob with metric allen wrench.

To remove LH knob from Editor 2 & Praxis remove to metric allen set-screws & Pull knob & Varible button hard to remove as Varible button is a press fit on plunger rod then remove Keeper to remove Varible mech if needed

---

Praxis 48 Car ret cord put under backlash spring stud to keep from jumping out of u shape in spring also applies to Editor models

---

Editor 2 Car ret locks up on LH margin & final stop. Check that motor pulley & clutch are free & not gummed

Stabilimento Tipo-Litografico G. Canale & C. - Via Baltimora, 19 - Torino

(Giugno 1965)

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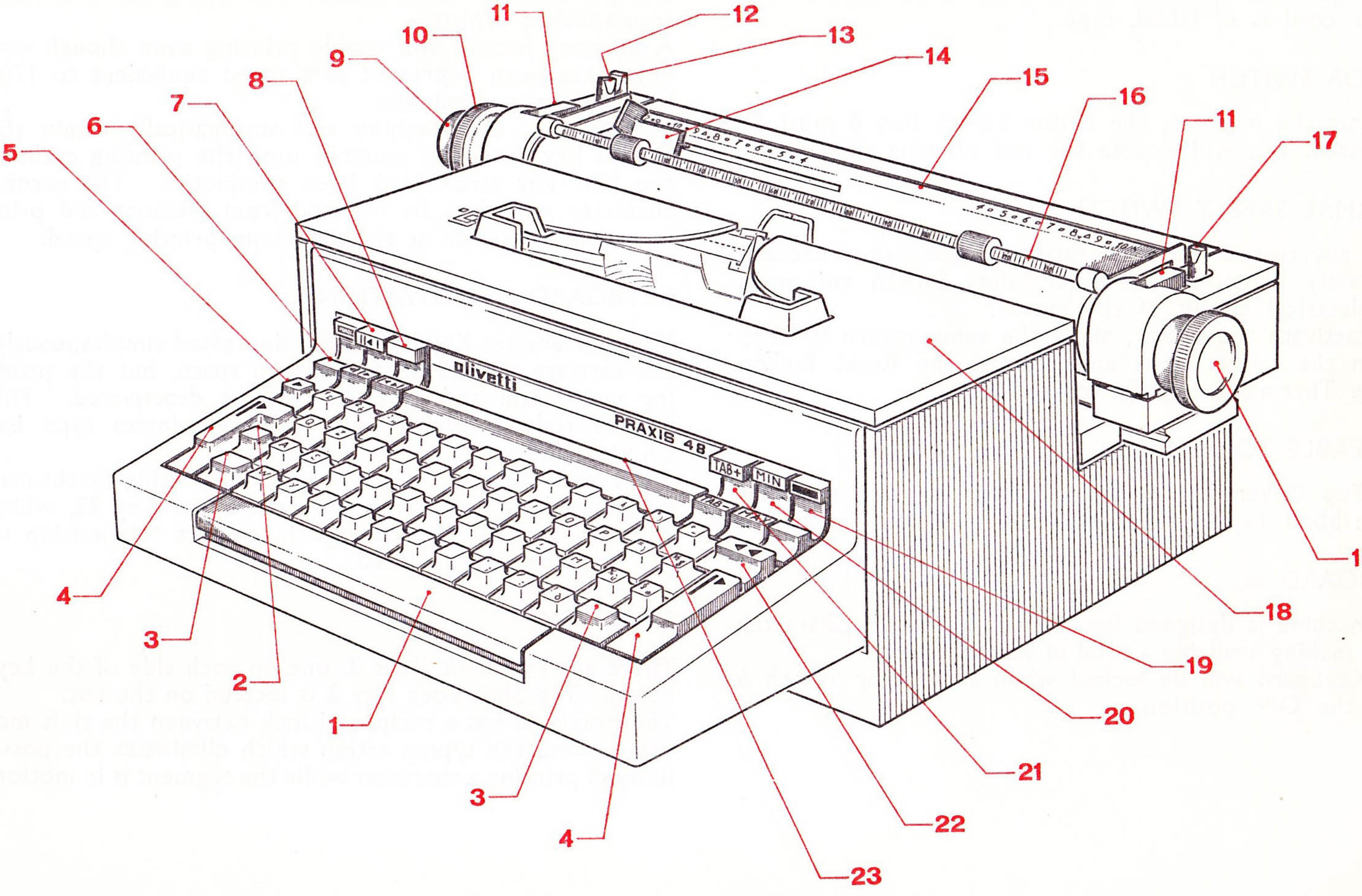
FEATURES AND SPECIFICATIONS

TECHNICAL SPECIFICATIONS

Machine Measurements:	cm. 33 × 33.7 × 15.9 inches 13 × 13 5/16 × 6 1/4
Weight:	10.5 Kilograms 23 lbs. 2 1/4 Ounces
Motor Power Consumption:	35 Watts (Approx.)
Character Keys:	46 Maximum 45 American Keyboard
Character Key Lever Travel:	4.3 mm. (.169") Non-Repeat 7.3 mm. (.287") Repeat
Platen Length:	310 mm. 12 3/16 inches
Length of Writing Line:	279 mm. 11 inches

MACHINE FEATURE IDENTIFICATION

1. Space Bar
2. Shift Lock
3. Shift Keys
4. Carriage Return and Line Space Keys
5. Half-Space Key
6. Motor Switch Key
7. Margin Release and Paragraph Indentation Key
8. Electric Margin Key
9. Variable
10. Platen Knobs
11. Carriage Release Keys
12. Line Space Selector
13. Automatic Line Finder
14. Lateral Paper Guide
15. Paper Centering Scale
16. Paper Holding Bail
17. Paper Release Lever
18. Moveable Top Cover
19. Ribbon Selector Key
20. Impression Control Key
21. Tabulator Set and Clear Key
22. Back Space and Keyboard Reactivation Key
23. Tabulator Bar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PRAXIS 48
TAB+
MIN
TAB-
MAX

MOTOR

The Praxis 48 is equipped with an Induction Motor which is designed to operate on 115 volts at 60 cycles. The power cord is of UNEL type.

MOTOR SWITCH

To start the machine, the Motor Switch Key **6** must be depressed, this will expose the red warning signal.

THERMAL SAFETY SWITCH

If for any reason the temperature of the motor exceeds the safety limits, the Thermal Safety Switch will open the electrical circuit of the motor.
To reactivate the motor, allow the temperature to drop within the safety limits and depress the Reset Button of the Thermal Safety Switch.

MOVEABLE TOP COVER

The Top Cover **18** can be positioned forward to facilitate ribbon replacement, type cleaning, etc.

KEYBOARD

The machine is designed for a maximum of 46 Character Keys, making available a total of 92 characters.
The Keyboard will be locked when the Motor Switch **6** is in the OFF position.

TYPING SPEED AND KEY LEVER SELECTION

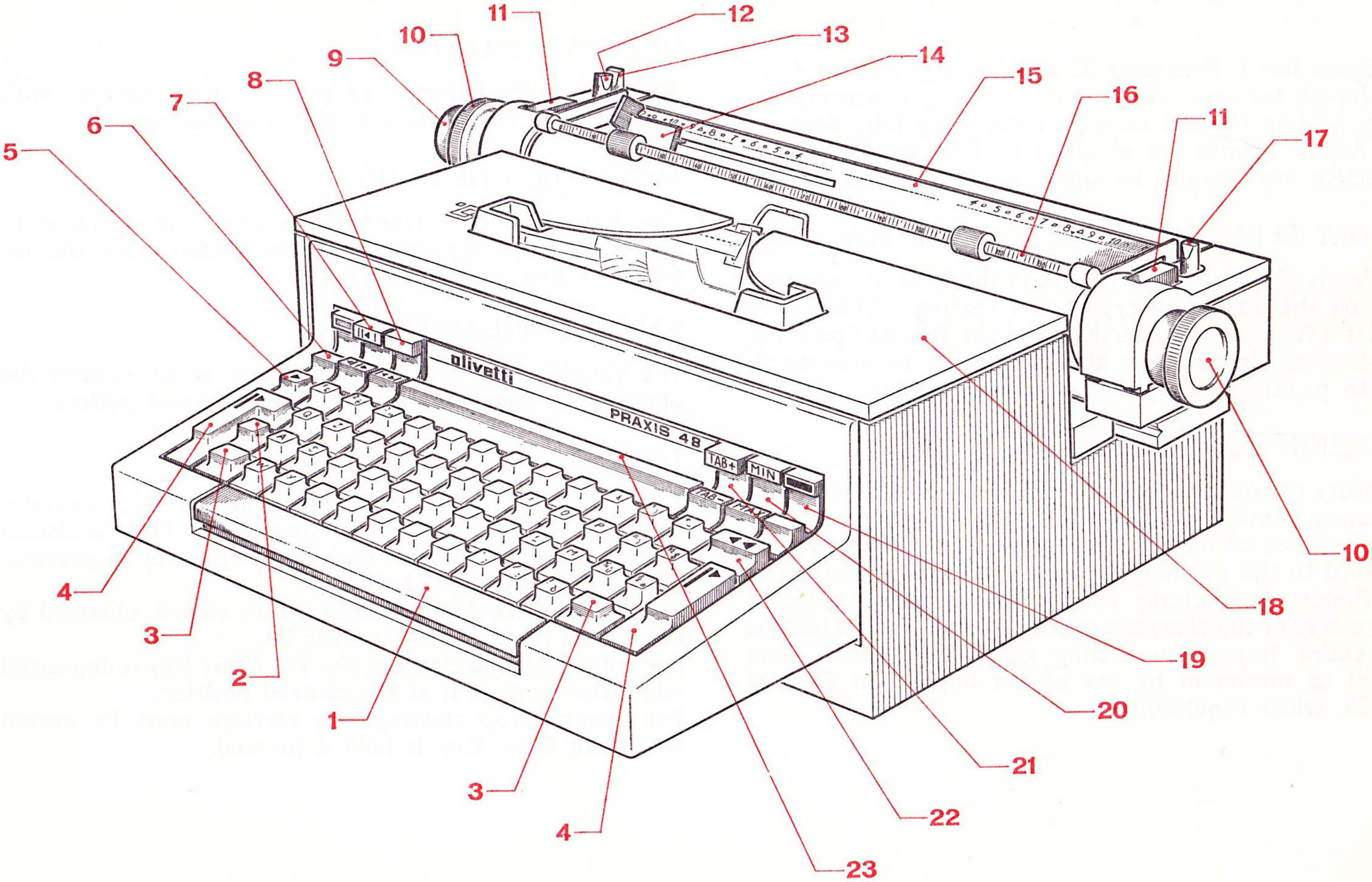
The Praxis 48 can print at a maximum speed of 840 characters per minute, which exceeds the typing speed of most accomplished typists.
A memory feature will enable printing even though two keys have been depressed at a speed equivalent to 1700 key strokes per minute.
In this case, the machine will automatically retain the second key stroke in memory until the printing cycle of the first key stroke has been completed. The second character will then be released from memory and print in proper sequence at the maximum printing speed.

KEYBOARD DEACTIVATION

If two Character Key Levers are depressed simultaneously, the carriage will advance a normal space, but the printing mechanism and keyboard will be deactivated. This feature reduces typing errors and eliminates type bar collision and jamming.
The reactivation of the keyboard and printing mechanism is obtained by depressing the Back Space Key **22**, which will also position the carriage in correct relationship to the last character printed.

SHIFT KEYS

There are two Shift Keys **3**, one on each side of the keyboard. The Shift Lock Key **2** is located on the left.
The Praxis 48 has a reciprocal lock between the shift movement and the typing action which eliminates the possibility of printing a character while the segment is in motion.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REPEAT KEYS

The standard keyboard of the Praxis 48 is equipped with the four following Repeat Character Keys:

x $\overset{-}{\underline{\quad}}$ · $\underline{\pm}$

The Space Bar **1**, Backspace **22** and Carriage Return **4** are also repeat features. Repeat line spacing is accomplished by holding the left carriage return key fully depressed. Repeat actions are obtained by fully depressing the respective key beyond its single action position.

MEMORY BETWEEN TYPE ACTION AND SPACE BAR

The Praxis 48 has a unique feature in the form of a memory between the actions of typing and spacing. This device enables a Repeat Character Key and the Repeat Space Bar action, when depressed at the same time, to provide alternate printing and spacing in correct order.

IMPRESSION CONTROL

To ensure the maximum uniformity of impression between characters, each type bar mechanism is controlled so that the force of impact of the type bar is directly proportional to the printing surface of the specific character. The Praxis automatically compensates for the increased surface area of the character when typing in capital letters. The entire impression setting can be increased from normal to maximum by use of the Impression Control Key **20**, when required.

TOUCH CONTROL

A Touch Control Knob, located underneath the keyboard, enables the operator to regulate the touch of the keyboard.

LINE SPACE SELECTOR

The Line Space Selector **12** provides the operator with the choice of four different widths of line spacing.

AUTOMATIC LINE FINDER

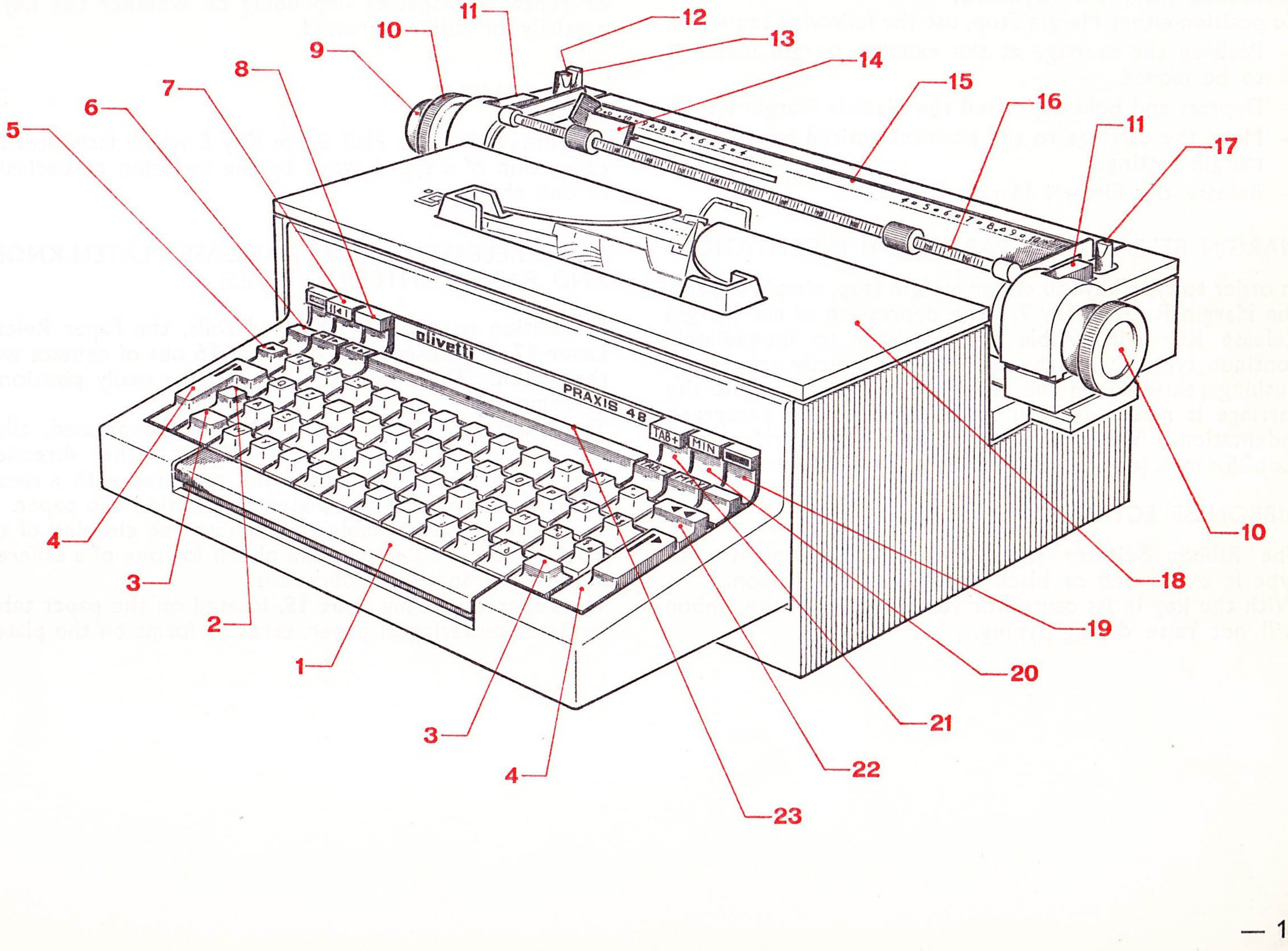
The Automatic Line Finder **13** enables the operator to obtain a temporary release of the platen from the established line space pattern.

VARIAVLE LINE SPACER

The Variable Line Spacer **9** is a device which enables the operator to start typing on a new line space *pattern.*

TABULATION

The Tabulator provides the possibility of fast, accurate, columnar listing of names, numbers, etc. The Tabulation Stops are preset in the desired position by depression of the Tab Set Key **21**.
The carriage tabulation to the preset stop is obtained by depression of the Tabulator Bar **23**.
For individual stop clearing, the Tab Clear Key is depressed while the carriage is at the desired position.
For general stop clearing, the carriage must be moved while the Clear Key is held depressed.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ELECTRIC MARGIN

Both left and right Margin Stops can be automatically positioned from the keyboard.
To position either Margin Stop, use the following sequence:

- Position the carriage at the existing margin which is to be moved.
- Depress and hold depressed the Electric Margin Key **8.**
- Move the carriage to the position desired for the new margin setting.
- Release the Electric Margin Key **8.**

MARGIN RELEASE AND PARAGRAPH INDENTATION

In order to type beyond either margin stop, simply depress the Margin Release Key **7.** The depression of the Margin Release Key will enable the operator to immediately continue typing with the characters correctly spaced.
Pushing rearward on the AUTO. PAR. Key **7**, while the carriage is returning, will result in automatic paragraph indentation. When this key is used, the carriage will stop 25.4 mm. (one inch) to the right of the left margin stop.

RIBBON SELECTION

The Ribbon Selector Key **19** enables the operator to type in either red or black portions of the ribbon.
With the key in its central or stencil position, the ribbon will not raise during typing.

BACKSPACE

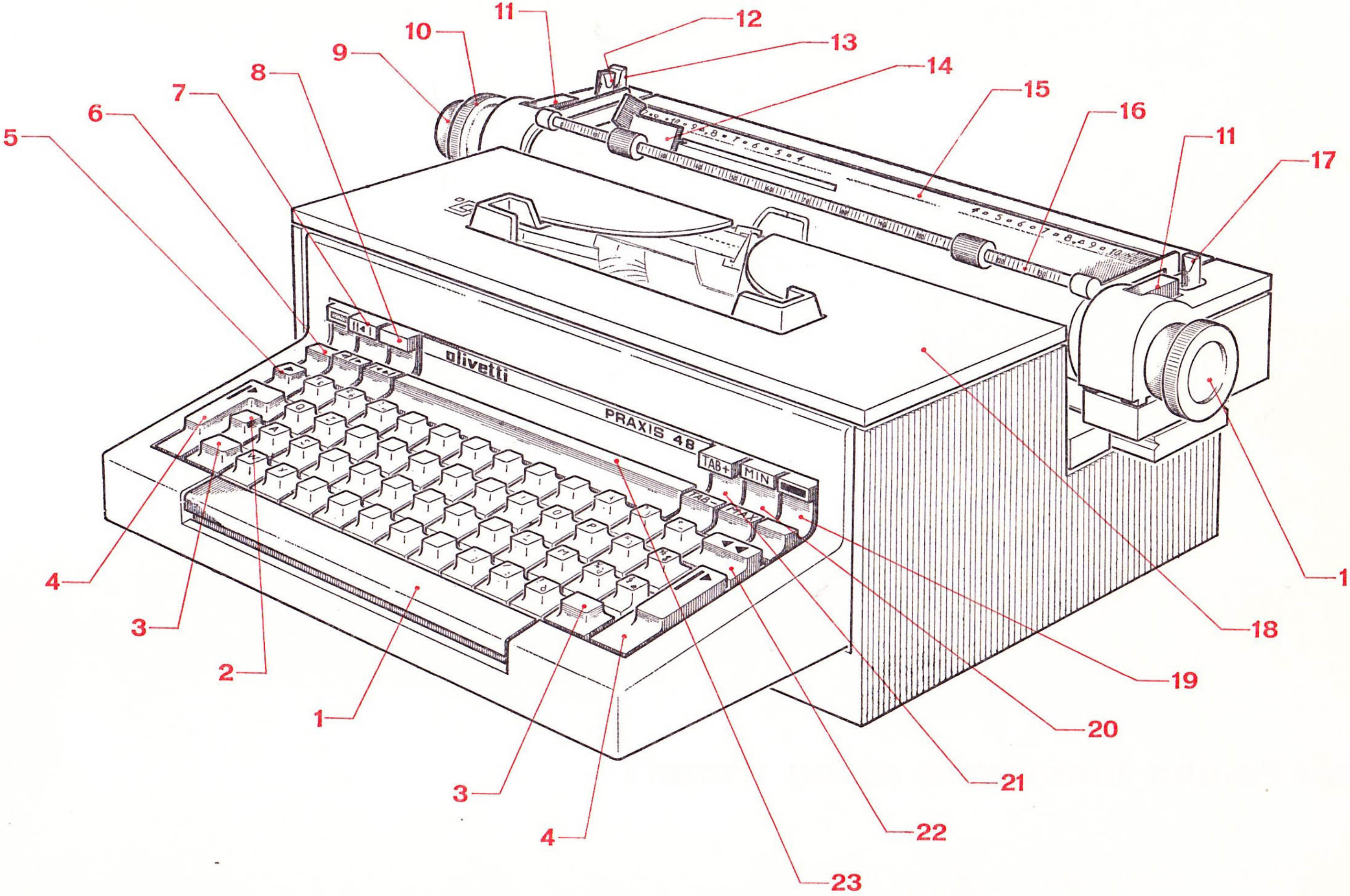
The Backspace Key **22** provides the choice of either single or repeat backspacing depending on whether the key is partially or fully depressed.

HALF SPACING

The Praxis 48 has a Half Space Key **5** which facilitates the correction of a typed word by the inclusion or exclusion of one character.

PAPER RELEASE, CARRIAGE RELEASE, PLATEN KNOBS, AND PAPER CENTERING SCALE

In addition to releasing the feed rolls, the Paper Release Lever **17** also raises the Paper Bail **16** out of contact with the platen. This allows the paper to be easily positioned or removed.
The Carriage Release Levers **11**, when depressed, allow the carriage to be moved manually in either direction.
The Platen Knobs **10** provide the operator with a means of manually rotating the platen to position the paper.
The platen is removeable to facilitate the cleaning of the machine, or to substitute the platen for one of a different density for specific applications.
The Paper Centering Scale **15**, located on the paper table, faciliates centering of paper, cards or forms on the platen.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Theory parts movement adjustments

MOTOR - POWER SHAFT AND CAMS

POWER TRANSMISSION

The Praxis 48 power transmission is obtained through an assembly of electrical and mechanical components which transform the electrical power into a constant rotation of the Power Shaft.
The power shaft rotation is obtained through the following:

— Electrical Components.

— Mechanical Components.

ELECTRICAL COMPONENTS

— The Receptacle **2** with ground connection.

— The Capacitor, which assures rotation of the motor in the correct direction.

— The Motor, supported by rubber mounts **A**, as shown in figure 2.

— The Thermal Switch **D**, mounted on the motor housing.

— The Motor Switch **9**, attached to the left external sidewall.

MECHANICAL COMPONENTS

— The Centrifugal Clutch **3**, which couples the motor with the mechanical components.

— The Belts **5** and **7**, and Pulleys **4**, **6** and **8**, which transmit the drive from the motor to the Power Shaft **11**.

— Power Shaft **11**, which rotates in Self Aligning Bushings located in both external sidewalls.
These Self Aligning Bushings **B** are held in position by the spring **K**, figure 3.

ELECTRICAL ACTIVATION

— The electrical power is supplied by closing the Contact Points **L** and **L_1** through rotation of the Motor Switch Key **10**.

MECHANICAL ACTIVATION

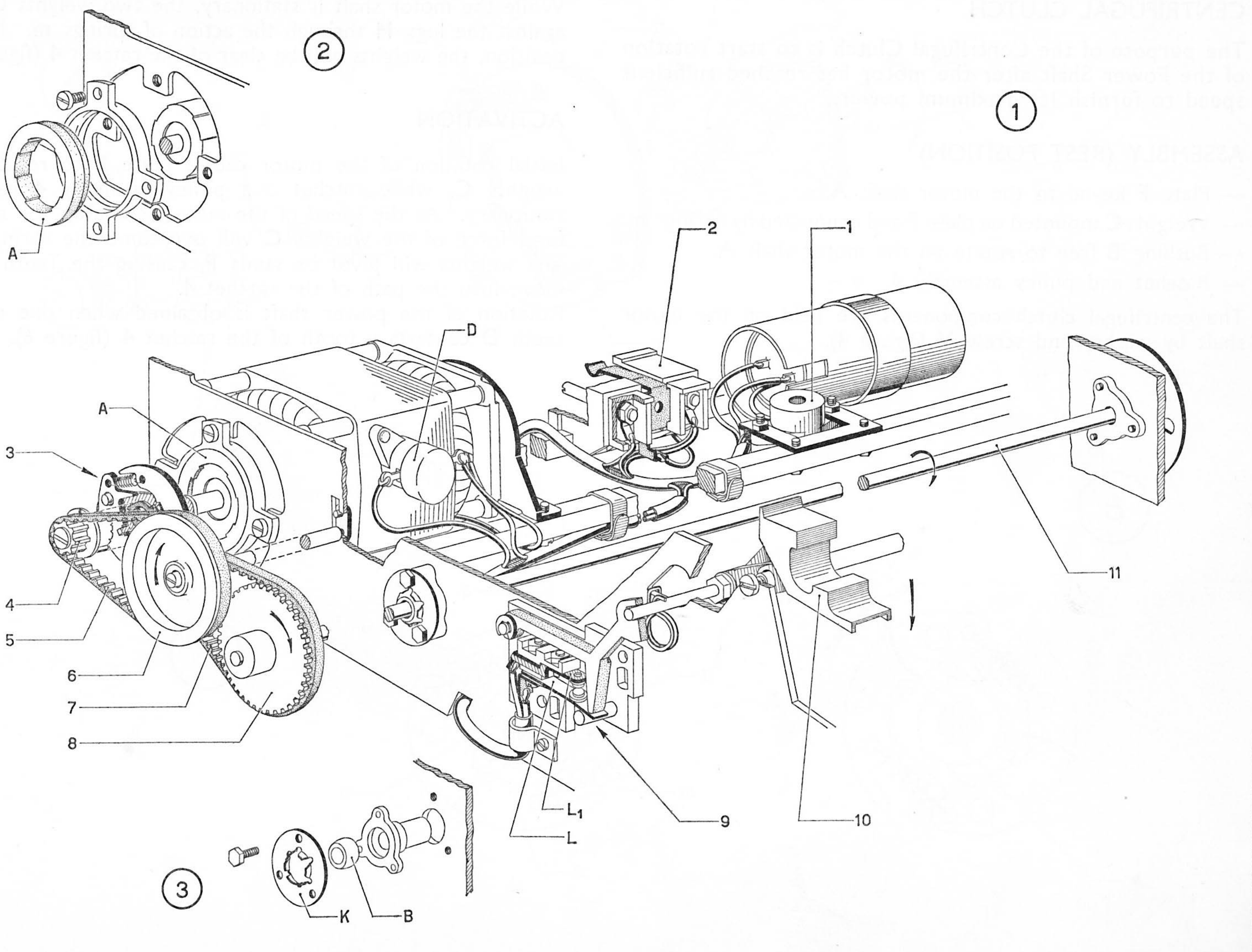
— The rotation of the Power Shaft **11**, at a constant speed of 280 R.P.M., is obtained through the system of belts and pulleys, illustrated in figure 1.
The activation of the system is only obtained when the motor reaches sufficient speed to engage the centrifugal clutch.

ADJUSTMENTS

1 - Figure 1

INTERMEDIATE PULLEY ADJUSTMENT

The Cog Belts **5** and **7** should be sufficiently tight to prevent the possibility of slipping over the pulley teeth.
To adjust: Raise or lower the intermediate pulley shaft as required. CAUTION: Do not tighten belts excessively, as this will cause noise.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A
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11
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L
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10
③
K
B

CENTRIFUGAL CLUTCH

The purpose of the Centrifugal Clutch is to start rotation of the Power Shaft after the motor has reached sufficient speed to furnish its maximum power.

ASSEMBLY (REST POSITION)

— Plate **F** keyed to the motor shaft **A**.
— Weights **C** mounted on plate **F** and connected by springs **m**.
— Bushing **B** free to rotate on the motor shaft **A**.
— Ratchet and pulley assembly **4**.

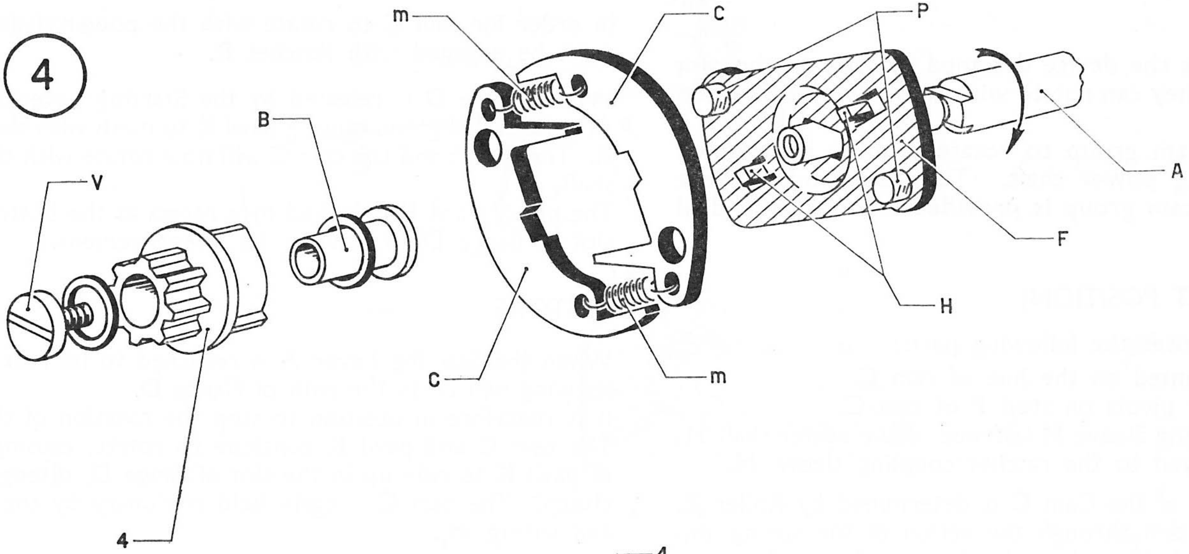
The centrifugal clutch components are held on the motor shaft by washer and screw **V** (figure 4).

While the motor shaft is stationary, the two weights **C** rest against the lugs **H** through the action of springs **m**. In this position, the weights will be clear of the ratchet **4** (figure 5).

ACTIVATION

Initial rotation of the motor causes plate **F** to rotate the weights **C**, while ratchet and pulley assembly **4** remains stationary. As the speed of the motor increases, the centrifugal force of the weights **C** will overcome the springs **m**. The weights will pivot on studs **P**, causing the Teeth **D** to move into the path of the ratchet **4**.
Rotation of the power shaft is obtained when one of the teeth **D** contacts a tooth of the ratchet **4** (figure 6).

4



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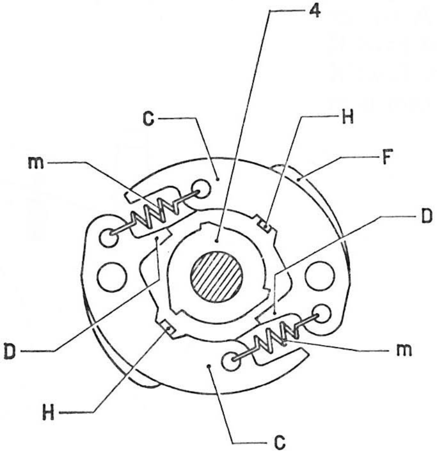

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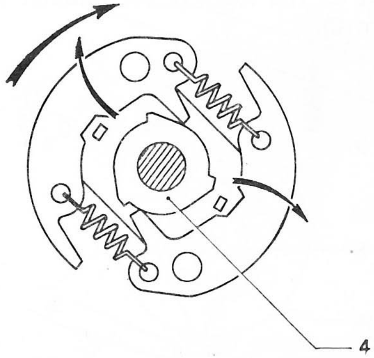


CAM CLUTCH

FOREWORD

The cam clutch is the device designed to activate the cam groups, so that they can rotate with the power shaft when required.
In order for a cam group to rotate it must be coupled with the rotating power shaft. To enable independent activation, each cam group is provided with an individual clutch.

ASSEMBLY (REST POSITION)

The clutch comprises the following parts:

- Flange **D** mounted on the hub of cam **C**.
- Pawl **K** which pivots on stud **P** of cam **C**.
- Ratchet Coupling Sleeve **M** fastened to the power shaft **11**.
- Ratchet **R** keyed to the ratchet coupling sleeve **M**.

The rest position of the Cam **C** is determined by Roller **Z**, held against the cam through the action of the spring m_1. The Flange **D** is held against the Starting Lever **A** by its spring **m**. As the roller **Z** detents cam **C**, the pin of Pawl **K** is at the top of the slot in flange **D**. In this position, Pawl **K** is held clear of the teeth of the Ratchet **R**, and the cam is at rest (figure 8).

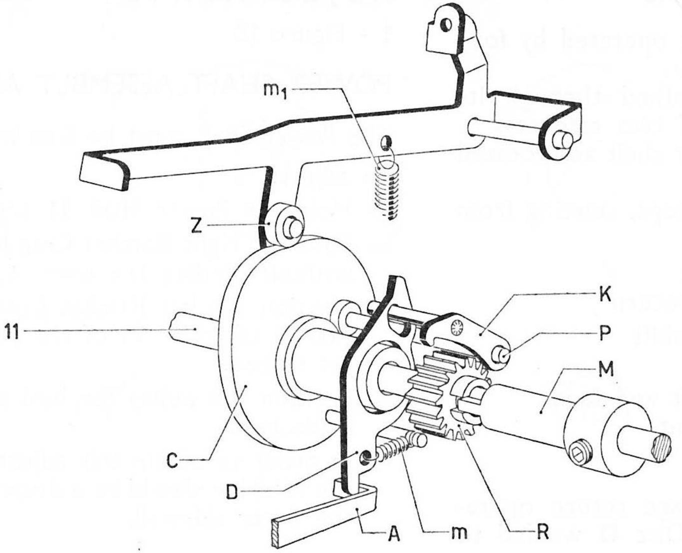
ACTIVATION

In order for cam **C** to rotate with the power shaft, Pawl **K** must be engaged with Ratchet **R**.

When Flange **D** is released by the Starting Lever **A**, spring **m** rotates it slightly, causing pawl **K** to mesh with the Ratchet **R**. The clutch and the cam **C** will now rotate with the power shaft.
The pin of pawl **K** is locked by a recess at the bottom of the slot in flange **D** to prevent its disengagement.

RESTORE

When the Starting Lever **A** is returned to its rest position, its wing will be in the path of Flange **D**.
It is therefore in position to stop the rotation of the flange. The cam **C** and pawl **K** continue to rotate, causing the pin of pawl **K** to ride up in the slot of flange **D**, disengaging the clutch. The cam **C** is again held stationary by the roller **Z** and spring m_1.



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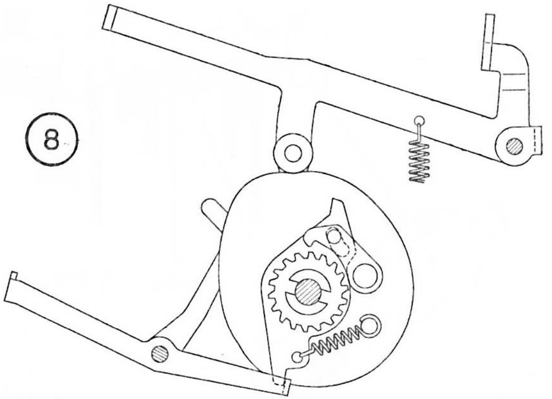

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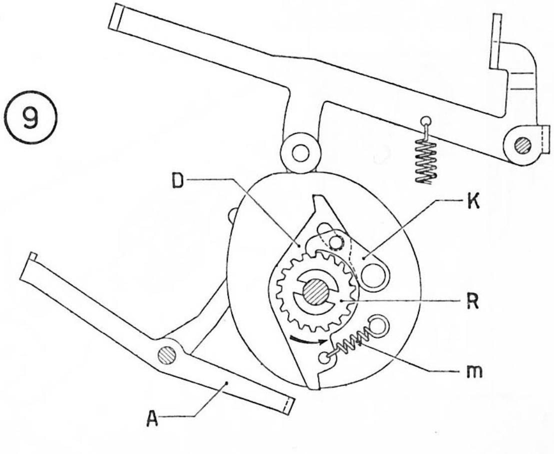


CAM GROUPS AND THEIR FUNCTIONS

The main functions of the Praxis 48 are operated by four cam groups on the power shaft.
Activation of each cam group is obtained through its respective clutch engaging with one of two ratchets.
These ratchets are secured to the power shaft and located between each pair of cam groups.
The functions of the respective cam groups, starting from the left, are as follows:

Service cam group **12**	— backspace — carriage return
Shift cam group **13**	— segment shift
Print cam group **14**	— printing — ribbon lift and feed — escapement
Spacing cam group **15**	— spacing

The carriage movement during a carriage return operation is obtained through the Friction Disc **D** welded to the right end of the Power Shaft **11**.

ADJUSTMENTS

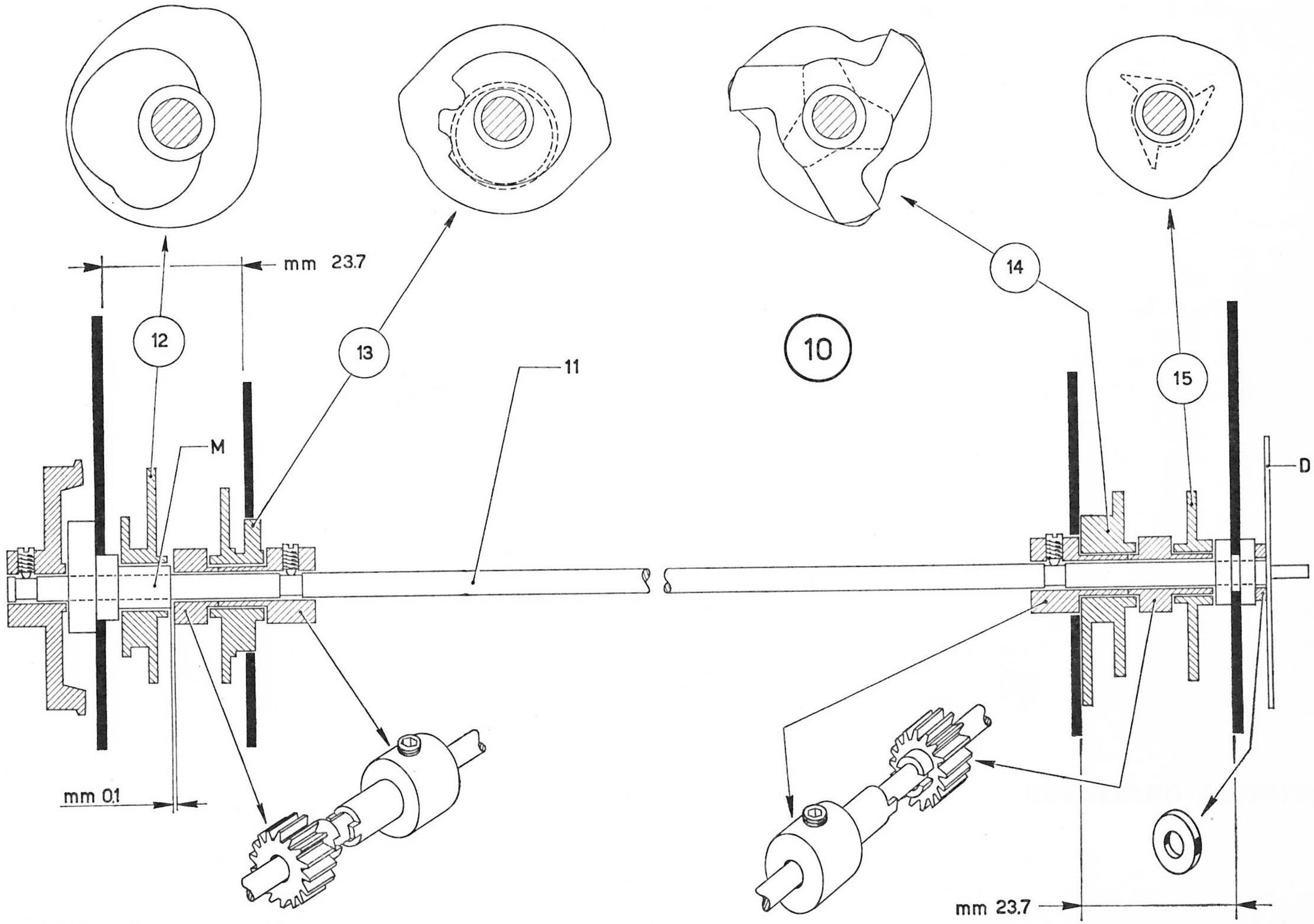
1 - Figure 10

POWER SHAFT ASSEMBLY ADJUSTMENT

The Power Shaft must be free with a minimum of end play.

To adjust:

- Hold the Power Shaft **11** towards the left.
- Push the right Ratchet Coupling Sleeve fully to the right without binding the cams, tighten set screws.
- Position the left Ratchet Coupling Sleeve within 0.1 mm. (.004″) of collar **M** of the power shaft bushing, tighten set screws.
- Position the pulley for best possible tracking of the cog drive belt.
- In order to obtain this adjustment, the inner sidewall of the machine should be a distance of 23.7 mm. (.933″) from the outer sidewall.

mm 23.7
12
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14
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10
11
M
D
mm 0.1
mm 23.7

KEYBOARD ASSEMBLY

FOREWORD

The Keyboard is the assembly of the parts required for the activation of typing.

The American Keyboard comprises 45 character keys, mounted on individual key levers and assembled in the keyboard housing.

The depression of a character key activates the " type action " and results in the printing of its respective character.

The character keys and the space bar are controlled by the key lever locking bar.

As already mentioned, the motor switch key can assume the following positions:

— OFF position: the electrical circuit is open and the machine is inoperative.

— ON position: the electrical circuit is closed and the machine is operative.

The relationship between the motor switch key and keyboard is as follows:

— With the motor switch key OFF the key levers and space bar are locked.

— With the motor switch key ON the key levers and space bar can activate their respective actions.

ASSEMBLY (REST POSITION)

— The Key Levers **16** are fitted in slots of the keyboard housing and held in position by the Retaining Plate **P**.

— The rest position of the Key Levers **16** is determined by their upper projection in contact with the Rubber Cushion Stop **G**. The key levers are held in this position by the action of the key lever return springs **m**.

MOTOR SWITCH KEY OFF

When the Motor Switch Key **10** is in the OFF position, the eccentric stud **E** holds the Key Lever Locking Bar **18** rotated down. In this position, the Rubber Cushion of the key lever locking bar **18** just clears the rear of the key levers **16**, and prevents the depression of a character key or the space bar. The motor switch key is held in the OFF position by the action of toggle spring **S**.

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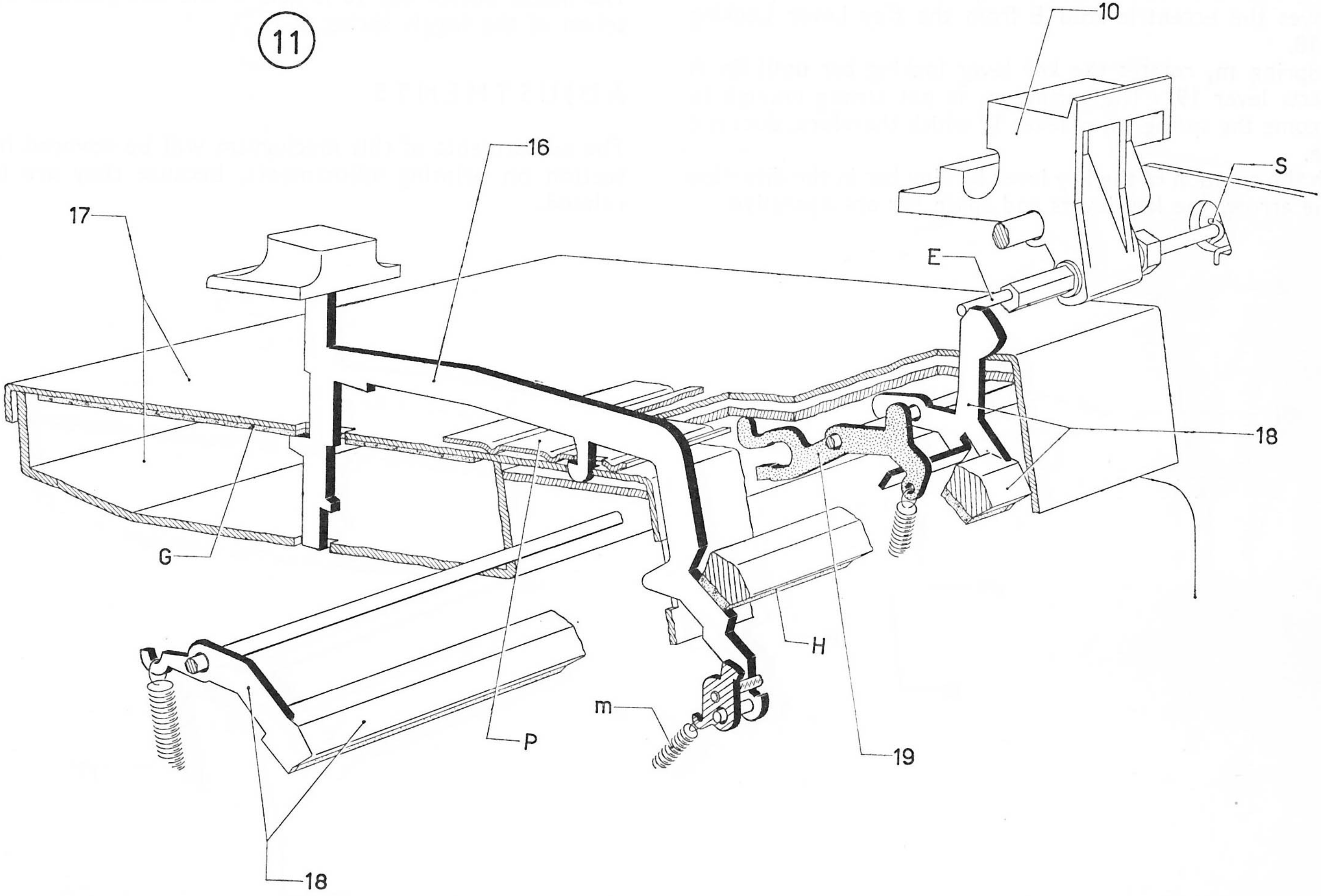


MOTOR SWITCH KEY ON

Rotation of the Motor Switch Key **10** to the ON position removes the eccentric stud **E** from the Key Lever Locking Bar **18**.

The spring **m_1** rotates the key lever locking bar until lip **A** contacts lever **19**. The spring **m_1** is not strong enough to overcome the spring **m_2** of lever **19** which therefore, does not move.

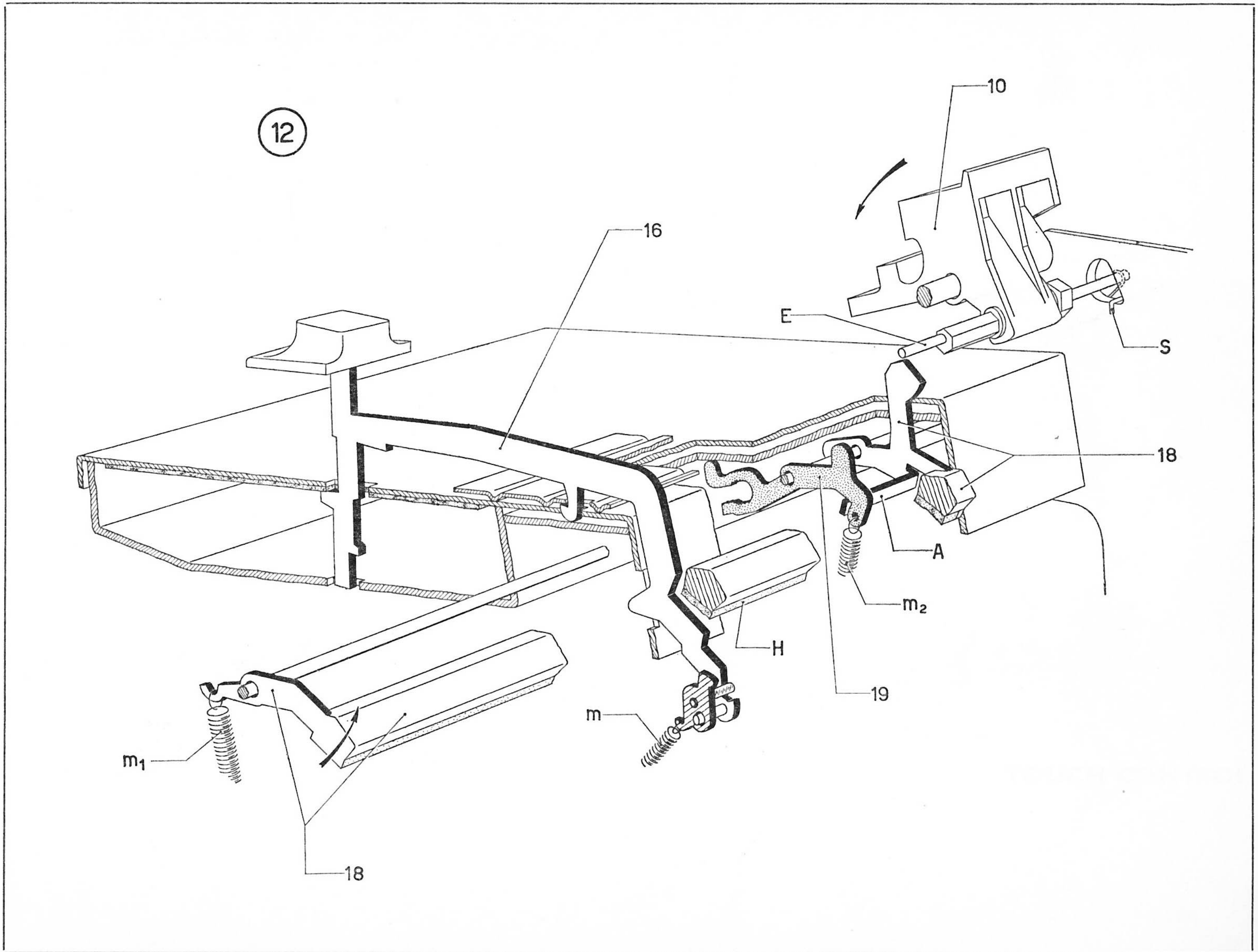
With the rotation of the key lever locking bar in the direction of the arrow, the key levers and space bar are operative.

The key levers are cushioned in their final downward movement by the yielding of spring **m_2**.

The motor switch key **10** is held in the ON position by the action of the toggle spring **S**.

ADJUSTMENTS

The adjustments of this mechanism will be covered in the section on printing adjustments, because they are interrelated.


12
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18

TOUCH CONTROL

FOREWORD

A touch control device is provided so that the operator can regulate the touch of the keyboard to her personal choice.
This is done by increasing or decreasing the tension of the key lever return springs.

ASSEMBLY

The Key Levers **16** are held in the rest position by the key lever return springs **m**, hooked between the Key Lever Trip Pawl and the Anchor Frame **23**. The radial position of the anchor frame **23** is controlled by the angular position of the moveable bracket **22**. In turn, bracket **22** is controlled by the fixed bracket **20** in conjunction with plate **21** and threaded shaft of the Touch Control Knob **24**.

ACTIVATION

Rotation of the touch control knob in the direction of the minus sign decreases the tension of the springs **m**, causing a lighter touch. Turning the knob in the direction of the plus sign increases the tension of the springs **m**, resulting in a heavier touch.

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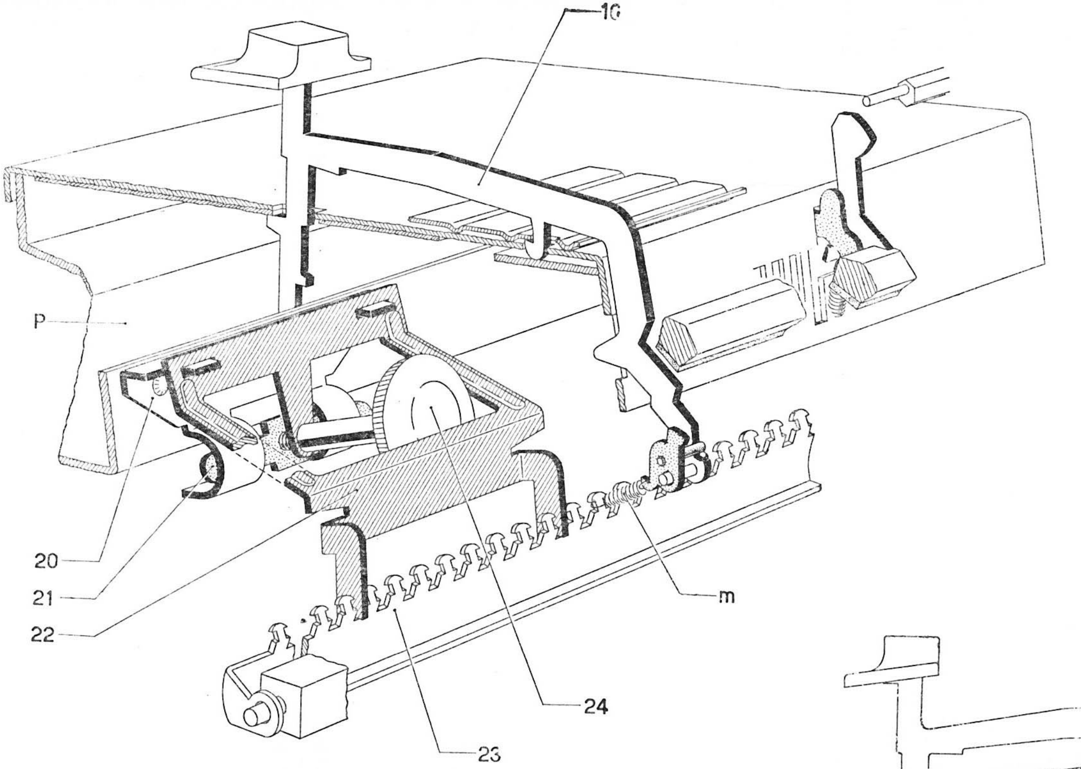

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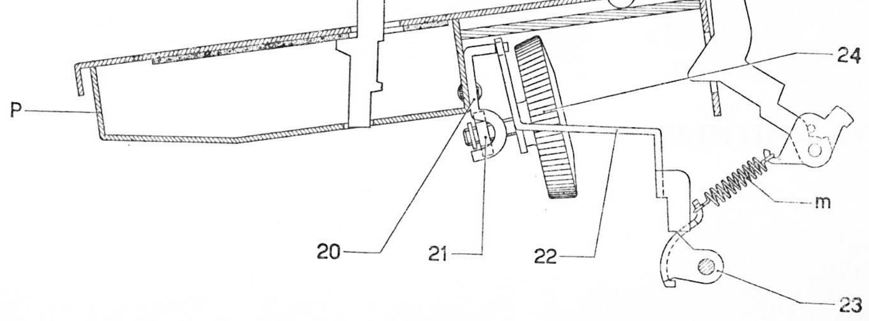


PRINTING CYCLE

FOREWORD

The main characteristic of the Praxis 48 is the principle on which is based the method of printing.

RAISING THE TYPE BAR TO THE PRINTING POINT THROUGH SPRING ACTION

Other unique characteristics of the machine which contribute to the perfect uniformity of the typewritten work which this machine produces are:

- Printing action independent from other functions.
- Increased control of the type bars during their movement.
- Impression compensation between upper and lower case characters.

The type action of the Praxis 48 is therefore completely independent from:

- External factors such as:
  frequency and voltage fluctuations which vary the speed of the motor.
- Internal factors such as:
  ribbon lift to black or red
  ribbon feed during reverse action
  escapement trip at varying carriage positions which absorb varying amounts of energy.

In order for the printing to take place it is necessary to:

- Select the proper type bar mechanism.
- Activate the print cam group.

These two operations are obtained by the operator through the command mechanism.

During the printing cycle, the following movements must occur:

- Raise the selected type bar to the printing point.
- Raise and feed the ribbon.
- Advance the carriage.

These operations will be performed by three independent mechanisms activated by the three profiles of the print cam group.

COMMAND MECHANISM

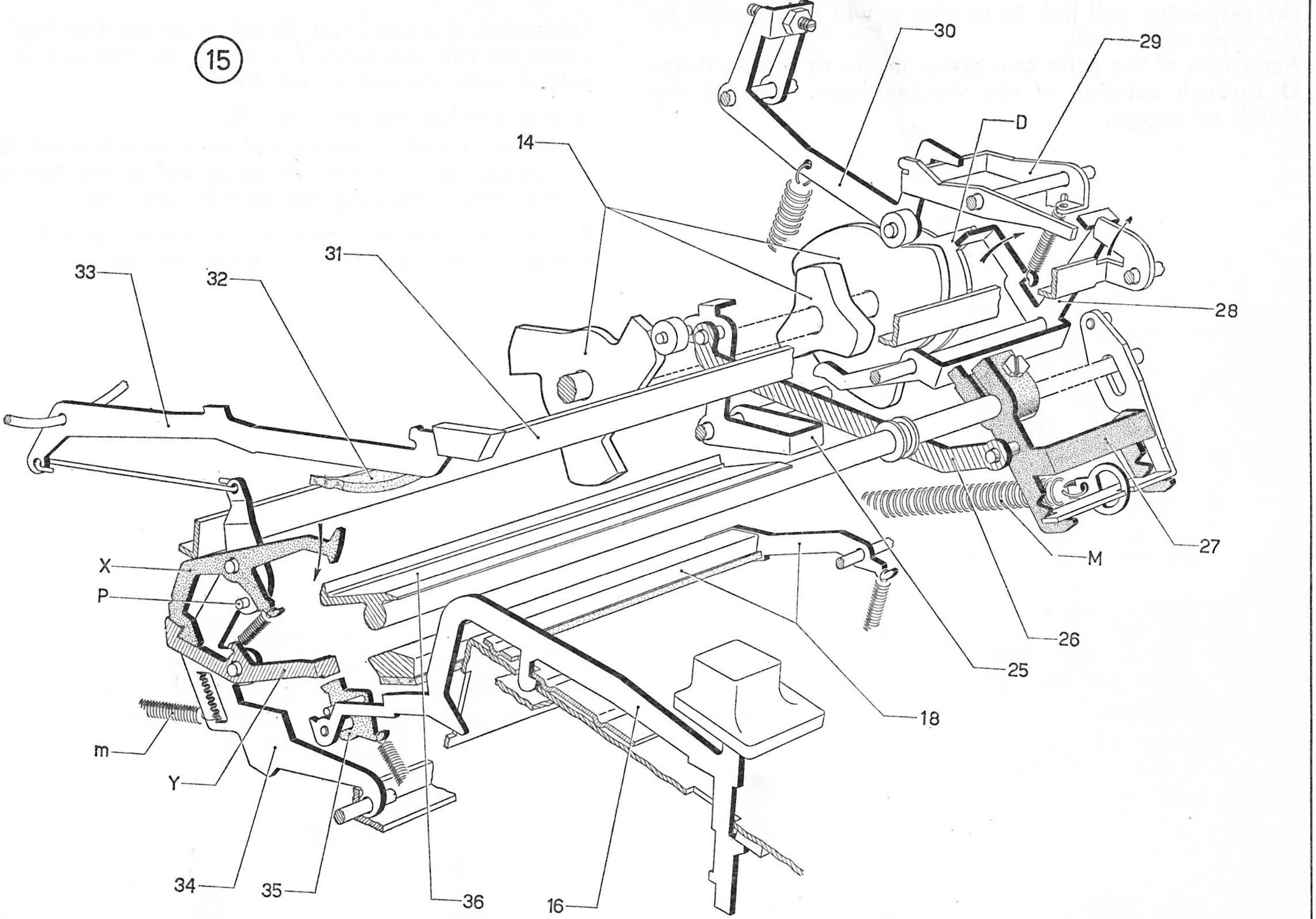
The command mechanism has the purpose of:

- Selecting the proper type bar mechanism.
- Activating the print cam group.

ASSEMBLY (REST POSITION)

- In figure 15 the entire mechanism is at rest. The Type Bar **33** is on the Type Bar Nest **32** and, through the connecting link, establishes the rest position of the Bell Crank **34**. This chain of parts is maintained in position by the action of the spring **m**.
- Assembled on pivot studs of the bell crank are the Pull Link Latch **Y** and the Pull Link **X**, held in position by their connecting spring.
  The hook of the pull link must be able to position in the path of the Type Action Bail **36**.
- The Print Cam Activating Bail **31** rests on the Pull Links **X**. In this position it holds the Starting Lever **28**, preventing the release of flange **D** of the Print Cam Group **14**.
  The roller of the Type Action Escapement Trip Lever **30** holds the print cam group at rest.

⑮



Selection of the type bar mechanism means to position the respective pull link **X** so that it will be activated by the type action bail.

Activation of the print cam group means to release flange **D** through rotation of the starting lever, allowing the clutch to engage.

ACTIVATION OF THE COMMAND MECHANISM

Depression of a Key Lever **16** will cause the Trip Pawl **35** to rotate the Pull Link Latch **Y**, releasing the Pull Link **X** which rotates until stopped by pin **P**.

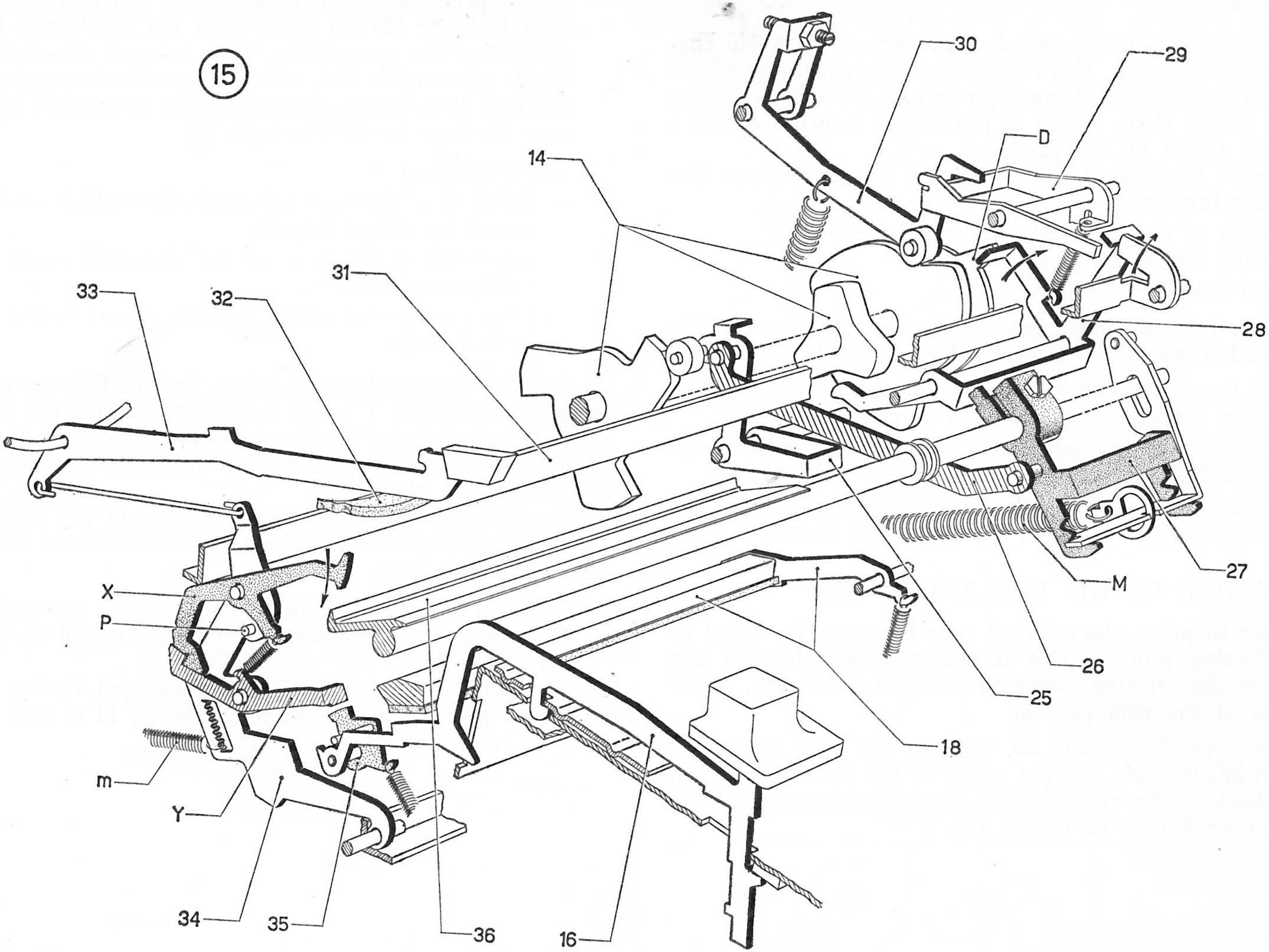
In this position the pull link **X**:

— Places its hook in the path of the type action bail **36**.

— Rotates the print cam activating bail in the direction of the arrow, releasing the starting lever **28**.

As the starting lever rotates, due to the action of its spring, it releases the flange **D** of the print cam clutch.

⑮



PRINTING

The maximum printing speed of the Praxis 48 is 840 characters per minute. This results from the capability of the machine to perform three type actions for each rotation of the power shaft, which as previously mentioned, has a constant speed of 280 R.P.M.
The three profiles of the print cam group perform the following functions:

- Raising of the selected type bar.
- Raising and feeding of the ribbon.
- Spacing of the carriage.

The first two of these movements will be examined in this section, the third after carriage assembly.

— The figure 16 illustrates the condition of the machine after a character key has been depressed.

  — Pull link **X** is positioned in the path of the type action bail **36**.

  — Rotation of the Print Cam Activating Bail **31** has resulted in release of the print cam clutch.

ACTIVATION OF THE TYPE ACTION BAIL

In order to print, the selected type bar must be raised to the printing point. This is accomplished through the action of the printing spring on the type action bail, under control of the cam profile.

— The Type Action Bail **36**, through the type action bail arm **27**, link **26**, and the roller of the cam follower **25**, is held at the rest position through the action of the Printing Spring **M** (figure 17).

— As the print cam starts rotating, the roller of the Print Cam Follower **25** will move from the high point **U** to point **T** of the cam profile. This causes a slow rotation of the type action bail, which progressively engages the pull link **X** to remove the slack in the linkage and slightly raise the type bar off the nest.

This eliminates:

- Rebound of the type bar mechanism which would be caused by violent impact;
- Vibrations in the type bar which would result from sudden accelerations;
- Erratic movement of the type bar caused by the slack in its linkage.

As the print cam continues to rotate, the cam follower moves from the high point **T** to the low point. During this movement, the cam follower is not actually in contact with the cam profile, therefore, it moves very rapidly, accelerating the type bar toward the platen.
Having almost exhausted its energy, spring **M** will not cause the roller of cam follower **25** to strike the bottom of the cam with significant force.

— Profile **R** of the print cam **14** will cause the cam follower **25** to restore the type action bail **36**, and reload the printing spring **M**.
The print cam clutch will be disengaged having completed printing and reloading of spring **M** in one third of a revolution of the print cam.

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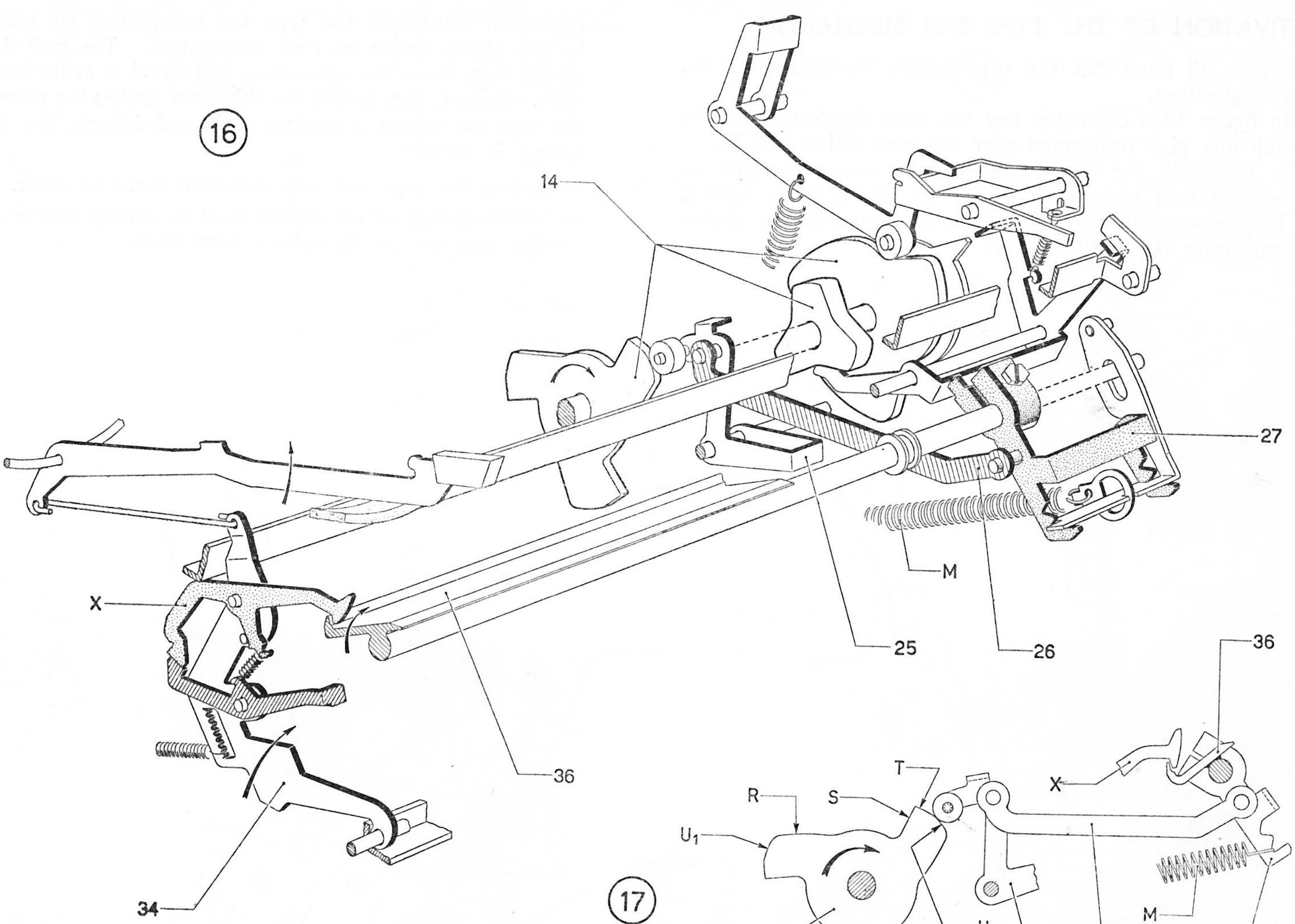

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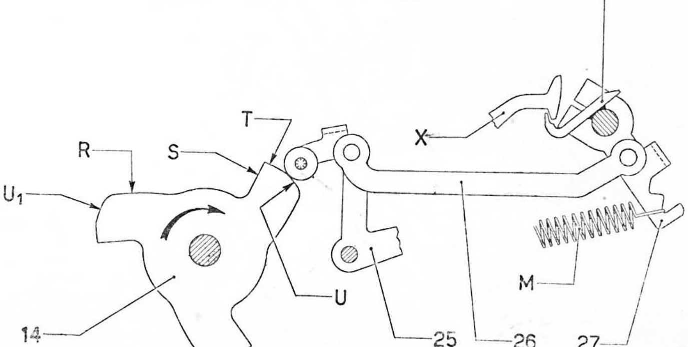
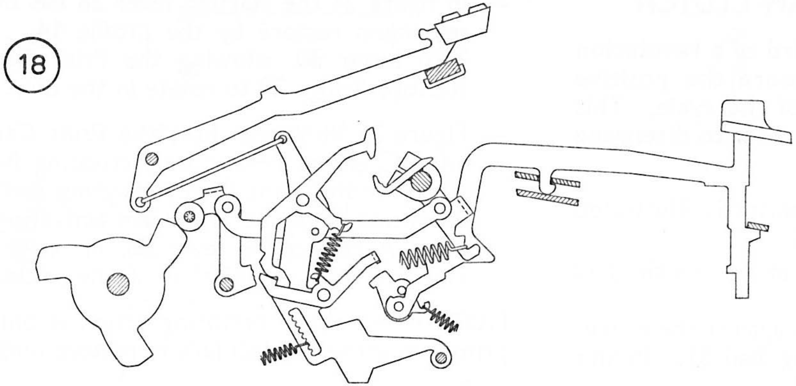


ACTIVATION OF THE TYPE BAR MECHANISM

- Figure 18 illustrates the type action mechanism at the rest position.
- In figure 19 a character key has been depressed and its pull link **X** is positioned over the type action bail **36.**
- In figure 20 the type action bail **36** moves through its full rotation under the power of the printing spring. This movement raises the type bar towards the platen relatching the pull link **X**.
- Figure 21 illustrates the type bar completing its travel to the platen under its own momentum. The pull link moves away from the type action bail which is at its maximum rotation. Just before the character strikes the platen, the type bar comes in contact with, and deflects, the leaf spring **B**, which:
  - Leaves the type bar with sufficient force to print.
  - Stores energy which will be used to initially accelerate the type bar on its return movement.

18



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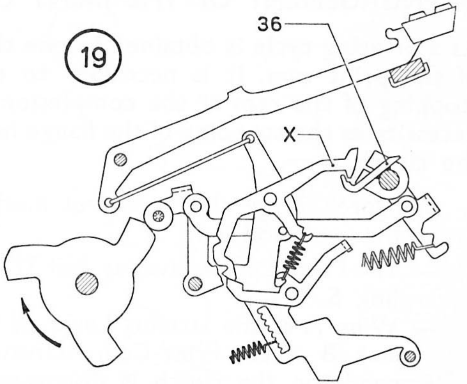

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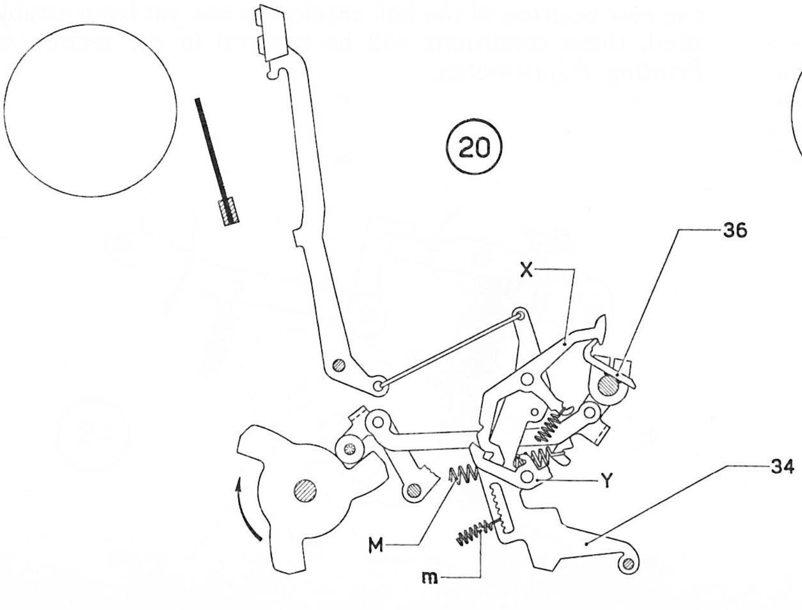

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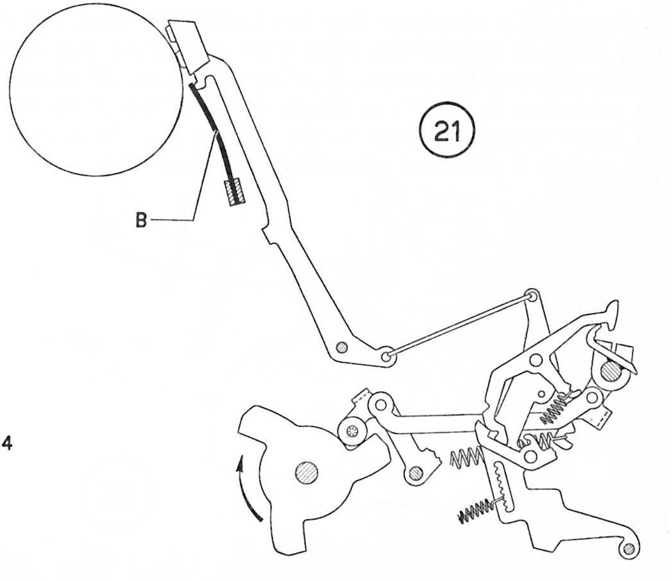


DISENGAGEMENT OF THE PRINT CAM CLUTCH

As a printing cycle is obtained in one third of a revolution of the print cam, it is necessary to ensure the positive stopping of the cam at the completion of the cycle. This necessitates the stopping of the flange in order to disengage the clutch.

In figure 22 the clutch control mechanism is illustrated at the rest position:

- The Print Cam Activating Bail **31** is at rest on the pull link **S**.
- Wing **A** of the Starting Lever **28** is against the extension **B** of the Print Cam Activating Bail **31**. In this condition the clutch is disengaged.
- The Type Action Escapement Trip Lever **30** establishes the rest position of the Print Cam and the Print Cam Activating Bail Restore Bridge **29**.

- In figure 23 a character key has been depressed and its pull link has rotated the Print Cam Activating Bail **31** in the direction of the arrow. The Starting Lever **28**, released by extension **B**, rotates in the direction of the arrow until its lower extension rests on the profile **14_1**. As a result, the clutch is released activating the print cam.

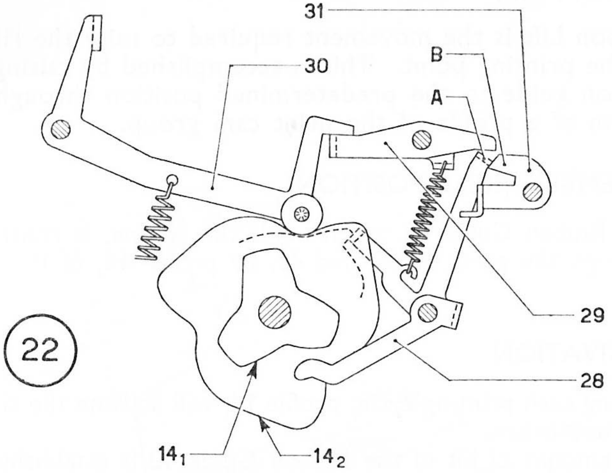
- In figure 24 the starting lever **28** has been rotated to its maximum restore by the profile **14_1**. Profile **14_2** raises Trip Lever **30**, allowing the Print Cam Activating Bail Restore Bridge **29** to rotate in the direction of the arrow.

- Figure 25 illustrates how the Print Cam will then cause wing **C** of the Print Cam Activating Bail Restore Bridge to lower the Print Cam Activating Bail. In this position, extension **B** of the print cam activating bail **31** will hold wing **A** of starting lever **28**, in order to disengage the clutch at the completion of the cycle.

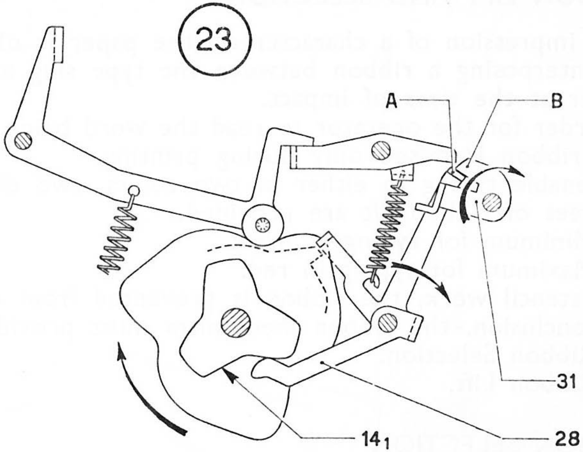
NOTE - The above restoring action is only necessary if the print cam activating bail fails to restore under its own weight.

ADJUSTMENTS

Since the angular position of the segment and therefore, the rest position of the bell cranks has not yet been established, these conditions will be covered in the section on Printing Adjustments.


31
30
B
A
29
28
14₁
14₂

22


A
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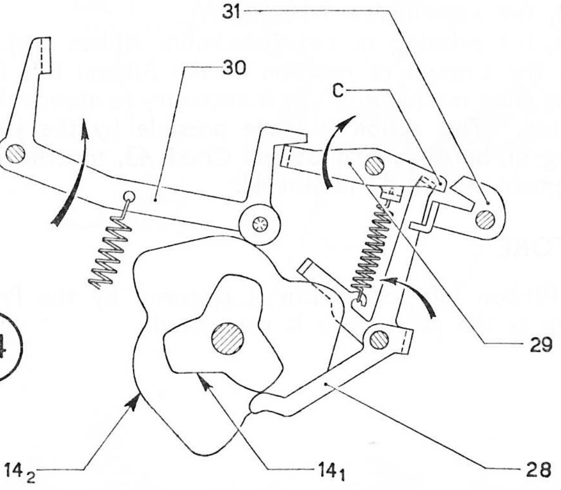
14₁

23


31
30
C
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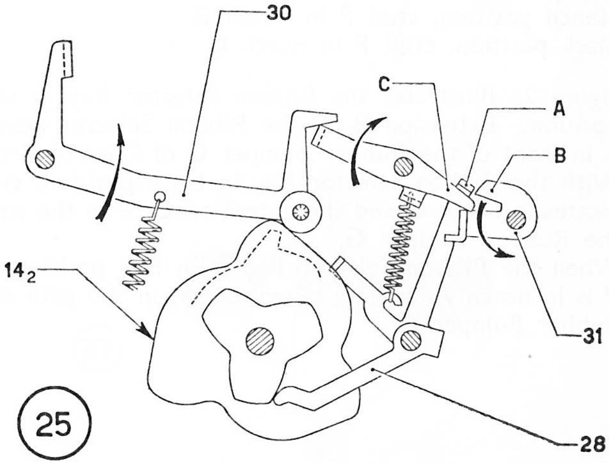
28
14₂
14₁

24


30
C
A
B
14₂
31
28

25

RIBBON LIFT AND SELECTION

The impression of a character on the paper is obtained by interposing a ribbon between the type slug and the paper at the time of impact.
In order for the operator to read the word being typed, the ribbon is raised only during printing.
To enable typing in either of two colors, two different degrees of ribbon lift are provided.

— Minimum for typing in black.
— Maximum for typing in red.

For stencil work, the ribbon is prevented from raising.
In conclusion, the ribbon mechanism must provide:

— Ribbon Selection.
— Ribbon Lift.

RIBBON SELECTION

The ribbon selector **37** may be set in any one of the three following positions:

— Red position, stud **P** in notch **A**.
— Stencil position, stud **P** in notch **B**.
— Black position, stud **P** in notch **C**.

— Figure 26 illustrates the Ribbon Selector Key in stencil position. Extension B_1 of the Ribbon Selector Lever **38** is in front of the Rubber Bumper **G** of Control Arm **39**.
— With the Ribbon Selector Key in black position, stud **P** locates in notch **C** and the extension C_1 is in the path of the Rubber Bumper **G**.
— When the Ribbon Selector Key is in Red position, stud **P** is in notch **A**, placing extension A_1 in the path of the Rubber Bumper **G**.

RIBBON LIFT

Ribbon Lift is the movement required to raise the ribbon to the printing point. This is accomplished by raising the ribbon guide to the predetermined position through the action of a profile of the print cam group.

ASSEMBLY (REST POSITION)

The Ribbon Guide **40** which holds the ribbon, is controlled through the parts **41**, **42** and **43**, by profile 14_1 of the print cam.

ACTIVATION

During each printing cycle, profile 14_1 will activate the ribbon lift mechanism.
The amount of lift of the Ribbon Guide **40** is established by the extension of the Ribbon Selector Lever **38** in front of the Rubber Bumper **G**.

— C_1 for printing in black (minimum ribbon lift).
— B_1 for stencil (no ribbon lift).
— A_1 for printing in red (maximum ribbon lift).

Since the amount of rotation of the Ribbon Lift Crank **43** always gives maximum lift, it is necessary to absorb the excess rotation. This action is made possible by the yielding of Spring **m**, between Arm **39** and Crank **43**, together with the movement of link **42** in slot **H**.

RESTORE

The Ribbon Lift mechanism is restored by the Print Cam Group as the print cycle is completed.

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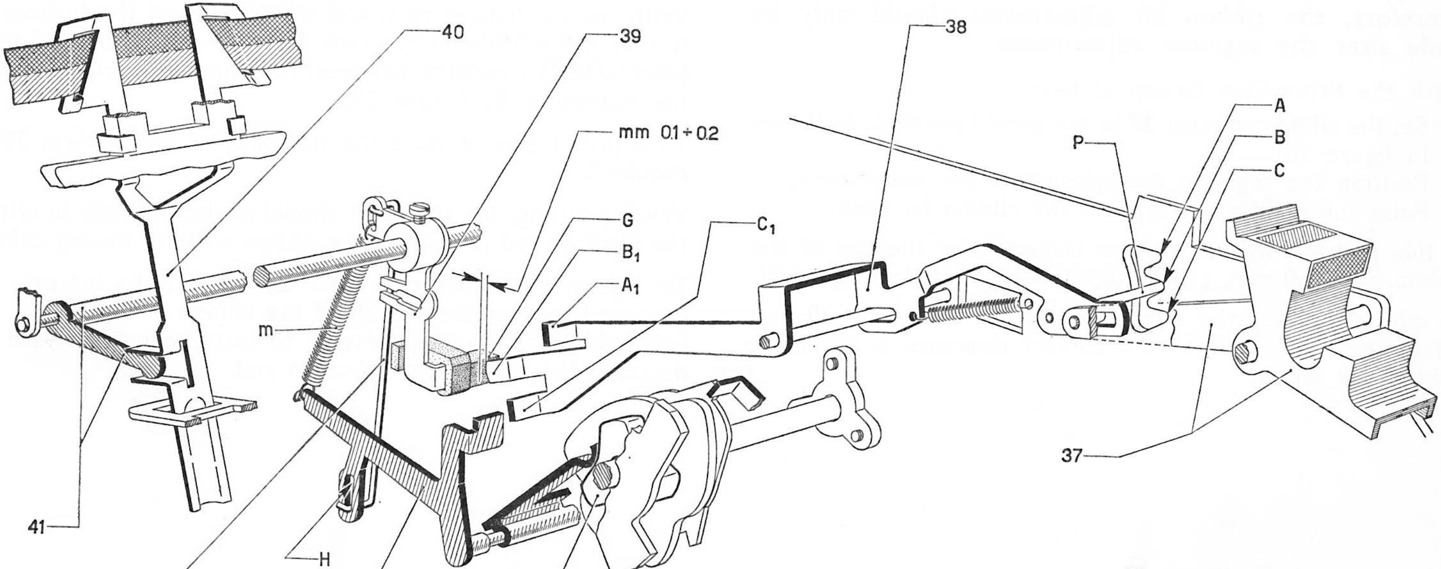

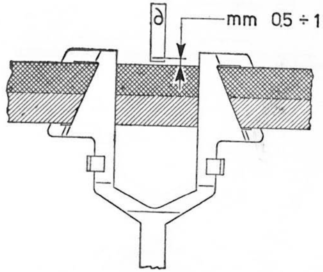

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ADJUSTMENTS

1 - Figure 26

RIBBON LIFT ADJUSTMENTS

The ribbon lift adjustments are made in conjunction with the type bars, and consequently, with the segment. Therefore, the ribbon lift adjustments should only be made after the segment adjustments.

With the Print Cam Group at rest:

— Set the ribbon selector **37** in the stencil position, as shown in figure 26.
— Position the segment for printing of the underscore.
— Raise the underscore type to the ribbon by hand.

In this position the underscore should clear the top of the ribbon by .5-1.0 mm. (.020″-.039″) as illustrated in figure 27.

To adjust: Loosen the screw on the Control Arm **39** and rotate the Shaft **41** until the correct clearance is obtained, tighten the screw.

The amount of ribbon lift obtained in accordance with the ribbon selection must be precise. The character must print centrally in the selected portion of the ribbon to avoid:

— Partial printing of the character.
— Mixing of the colors.

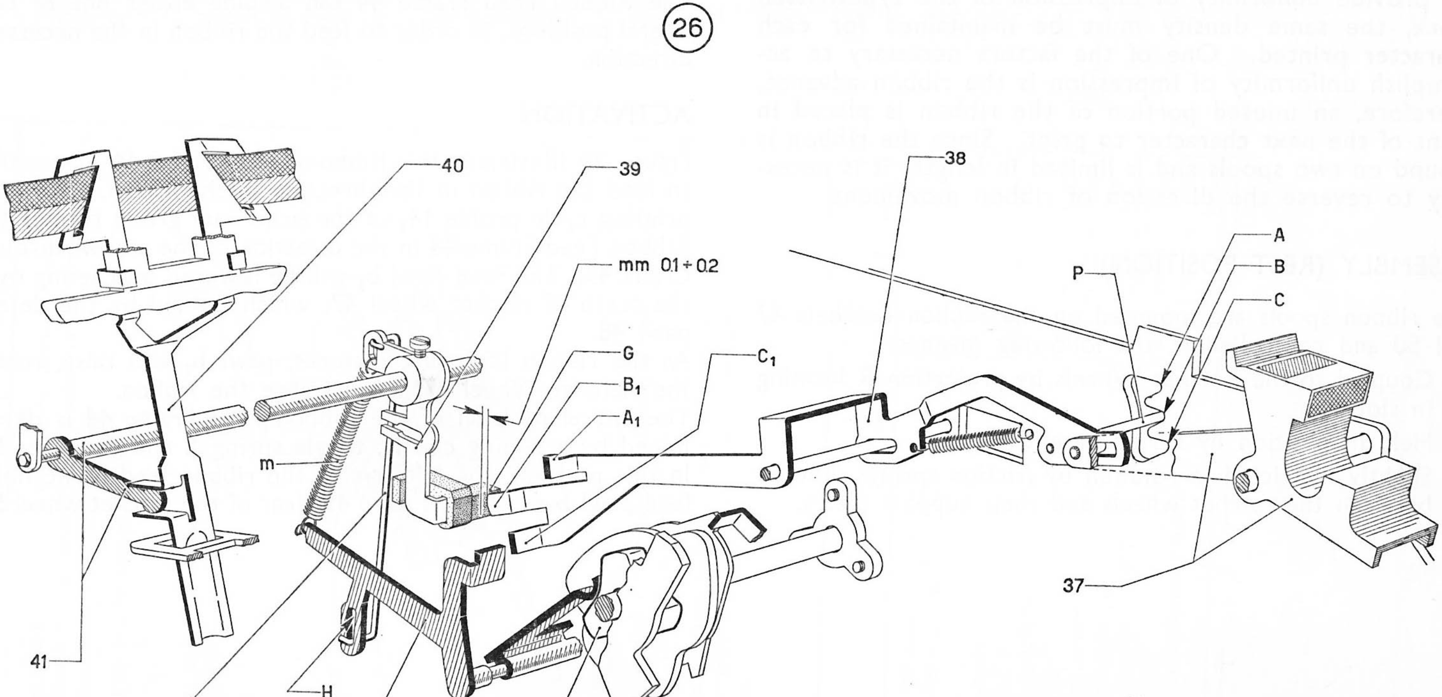
With the machine at rest, and the Link **42** at the bottom of slot **H** of the Ribbon Lift Crank **43**, there should be .1-.2 mm. (.004″-.008″) clearance between the Rubber Bumper **G** and the extension $\mathbf{B_1}$ (figure 26).

To adjust: Open or close the slot of the Control Arm **39** as required.

When printing, the character should strike centrally in either the black or red portion of the ribbon without mixing colors.

To adjust: Form the extension $\mathbf{C_1}$ forward to increase or rearward to decrease the lift of the ribbon in black.
Form the extension $\mathbf{A_1}$ forward to increase or rearward to decrease the lift of the ribbon in red.

(26)



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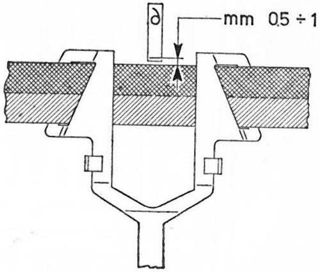


RIBBON FEED AND REVERSE

To provide uniformity of impression of the typewritten work, the same density must be maintained for each character printed. One of the factors necessary to accomplish uniformity of impression is the ribbon advance, therefore, an unused portion of the ribbon is placed in front of the next character to print. Since the ribbon is wound on two spools and is limited in length, it is necessary to reverse the direction of ribbon movement.

ASSEMBLY (REST POSITION)

The ribbon spools are mounted on the Ribbon Ratchets **47** and **50** and controlled in the following manner:

— Coupled to the Ratchet Wheels by projection **R** locating in slot **F**.

— Held in position by spring detent **H**.

— Slightly restricted in rotation by friction springs, housed between the ratchet wheels and their support plates.

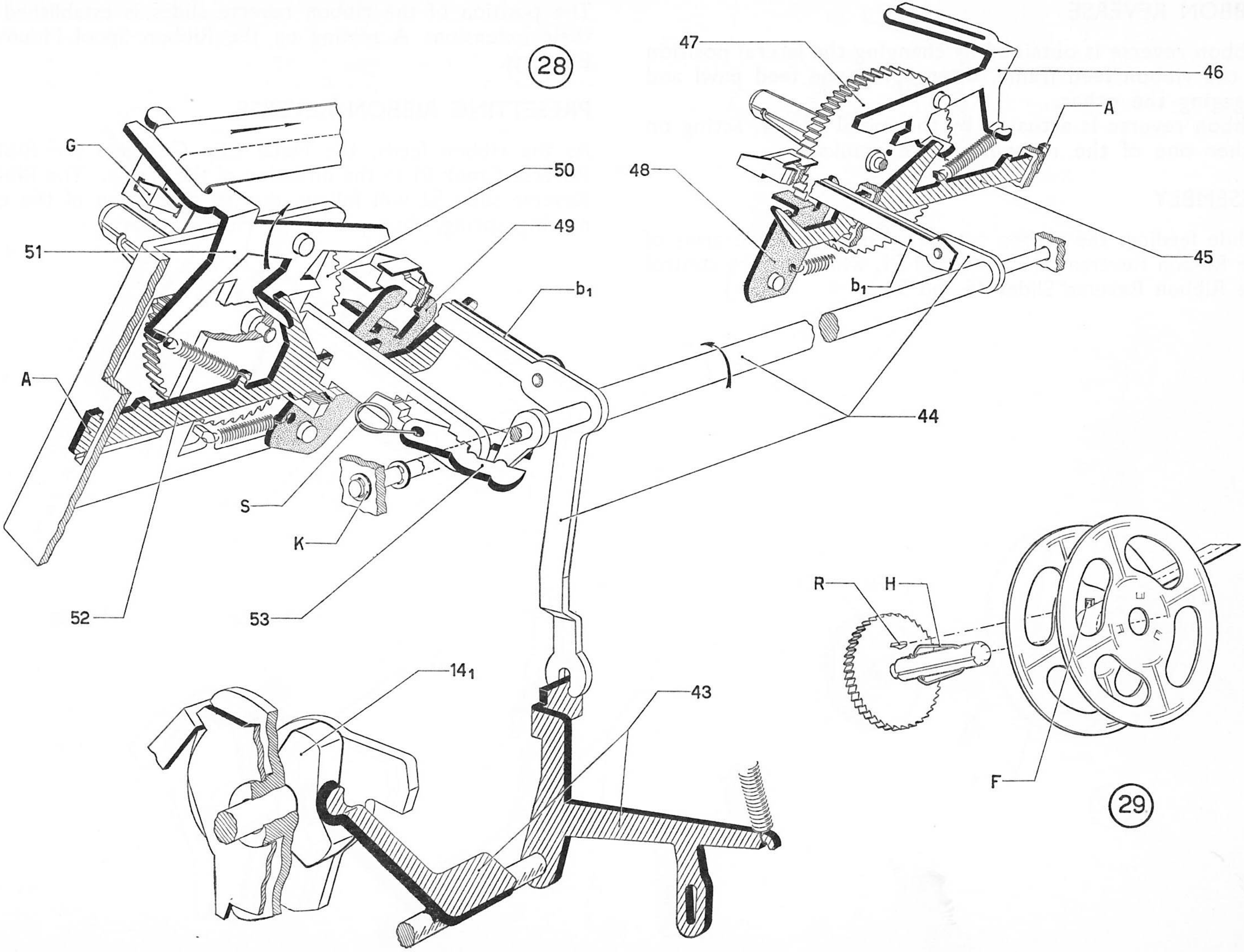
During the feeding of the ribbon only one of the two spools is driven, while the other is restricted from freely rotating. The Ribbon Feed Frame **44** can assume either one of two lateral positions, in order to feed the ribbon in the necessary direction.

ACTIVATION

Figure 28 illustrates the Ribbon Feed Frame **44** in position to feed the ribbon in the direction of the arrow. During a printing cycle profile **14_1** of the print cam group rotates the Ribbon Feed Frame **44** in the direction of the arrow, through Crank **43**. The Feed Pawl **b_1** will be lowered, ratcheting over the teeth of ratchet wheel **47**, which is held by the detent pawl **48**.

As the ribbon lift crank restores, pawl **b_1** will raise, rotate the Ratchet Wheel **47**, and advance the ribbon.

The lateral position of the Ribbon Feed Frame **44** is determined by retaining clip **K**, toggle spring **S** and stabilizer **53**. In this position, the left arm of the ribbon feed frame holds feed pawl **b** and detent pawl **49** clear of the ratchet wheel **50**.



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olivetti **stac** - TECHNICAL INFORMATION BULLETIN

compiled by STAC/IVREA	approved by	date 12/80	code 432.60.2	number G.03	**BIT**

subject and purpose Escapement (Improving the operation)	class or product LETTERA 10 - 12 systems or models U.110 - U.112

serial number L.10/12 - 0265251	implementation & time required (decimal hours)	customer engineer · to be implem. ☐ 1 L ☒ · for information only ☐ 2 L ☐ ☐ RED ☐	implementation procedure · for information only.... ☒ · mandatory retrofit...... ☐ · do not need to retrofit... ☐ · retrofit on first call . ☐ · can not be retrofitted.. ☐ · optional retrofit...... ☐

publications related to this bulletin General Manual	code and updating level 432.38....(01)	note Next updating

DESCRIPTION

Following modifications have been introduced to improve the escapement operation:

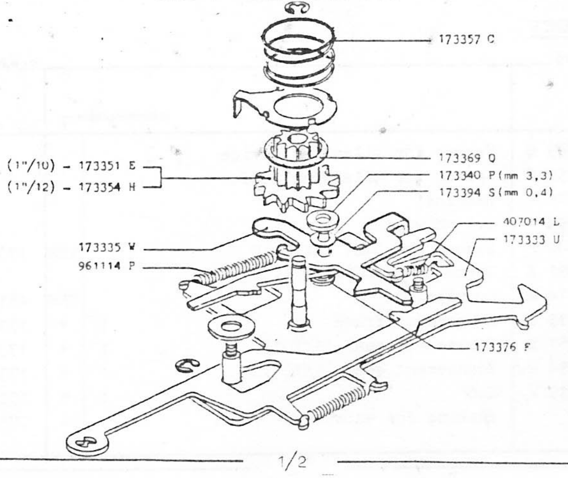
- A fiber washer has been added to the silencing device of carriage return.
- Bushing 173376 F has been modified.
- A 0.4 mm spacer has been put behind the mobile components of the escapement.
- Bushings 173377 G of the escapement gears have been eliminated.

The two escapement versions and the part numbers of the involved components are shown in figs. 1 and 2.

NOTE

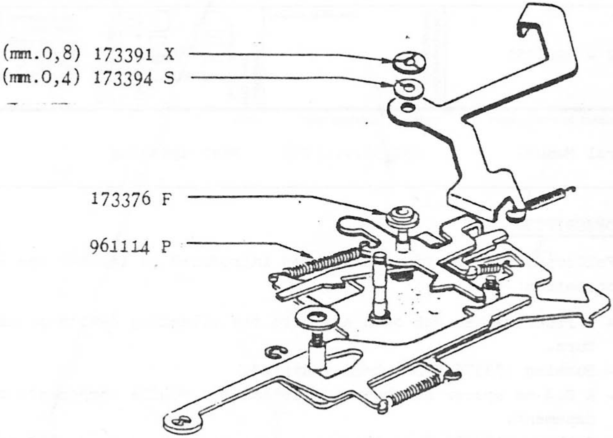
A. The modifications may be introduced on all the machines of this class.

FIG. 1 - Escapement L.10



B. When the new dog 173335 W is to be mounted on unmodified machines, check the engagement of the lever 173374 D with the dog itself. If necessary adjust the component 173374 D.

FIG. 2 - Escapement L.12



NOTES FOR THE SPARE PARTS

1 * Introduce the whole modification when replacing one of the suppressed components (no more available)

2 * The modifications of these components are not detectable by inspection, we recommend to order the modified components and take away the old ones.

COMPONENTS

ADDED PARTS New	Existent	Modified				Interchangeable	ELIMINATED PARTS	Available
X			173369 Q	Washer for silencing device				
2	*{	X	173357 C	Spring for silencing device				
		X	173376 F	Bushing				
X			173394 S	0.4 mm washer				
X			173340 P	Spacer (mm 0.3) for L.10		YES	173346 H	NOT
		X	173391 X	Spacer (mm 0.8) for L.12				
			961114 P	Cog spring		YES	681216 V	YES
X			173333 U	Escapement frame	1	*	173337 Y	NOT
X			173351 E	Escapement gear (1/10")	1	*	173341 C	NOT
X			173354 H	Escapement gear (1/12")	1	*	173342 D	NOT
X			173335 W	Cog	1	*	173345 G	NOT
				Bushing for escapement gears		-	173377 G	YES

RIBBON REVERSE

Ribbon reverse is obtained by changing the lateral position of the ribbon feed frame, disengaging one feed pawl and engaging the other.
Ribbon reverse is actuated by the metal clip **G**, acting on either one of the ribbon reverse cranks.

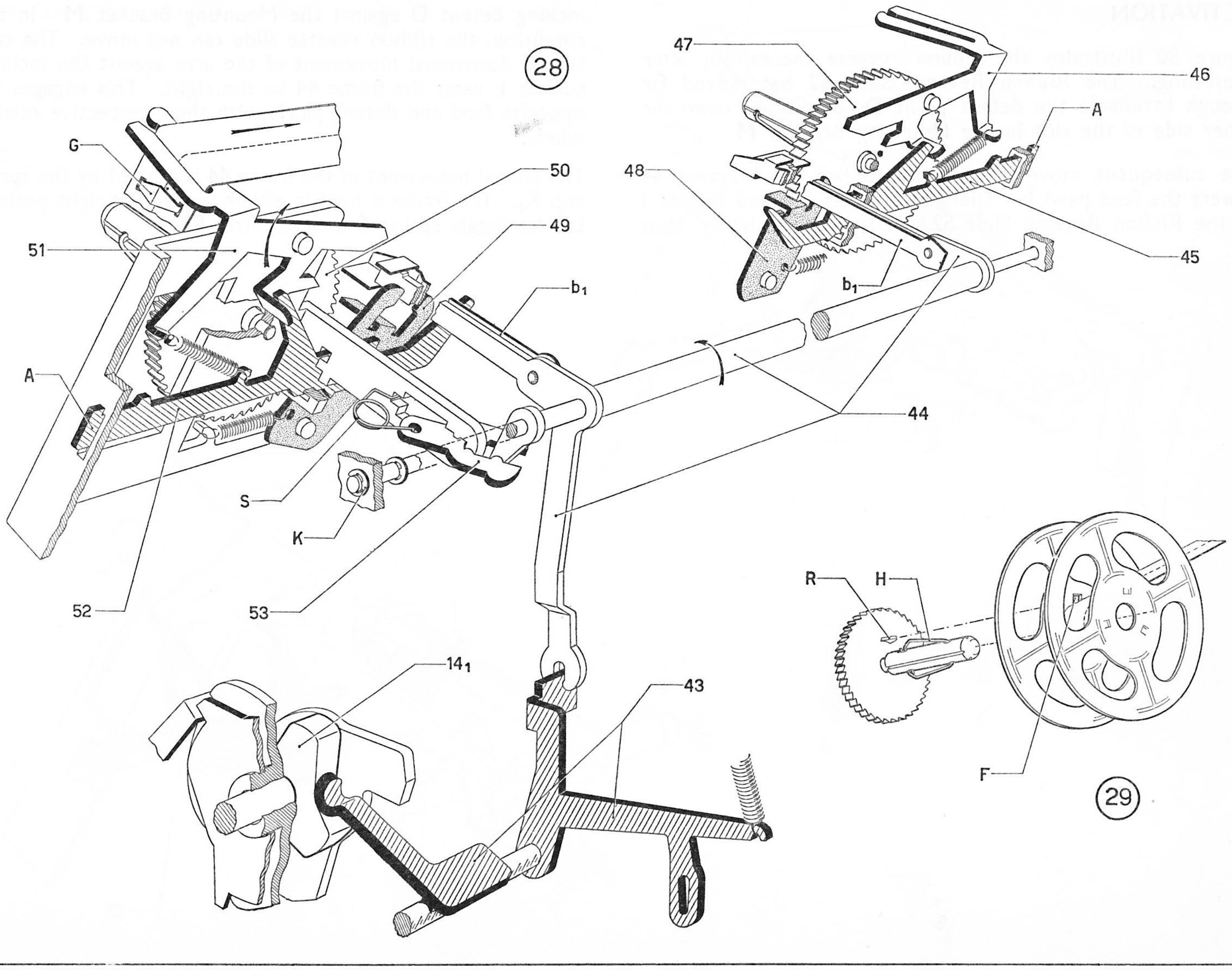
ASSEMBLY

While feeding, the ribbon travels within the guide arms of the Ribbon Reverse Cranks **46** and **51**, which in turn control the Ribbon Reverse Slides **45** and **52**.

The position of the ribbon reverse slides is established by their extensions **A** resting on the Ribbon Spool Mounting Brackets.

PRESETTING RIBBON REVERSE

As the ribbon feeds, the Metal Clip **G** pivots the Ribbon Reverse Crank **51** in the direction of the arrow. The Ribbon Reverse slide **52** will follow, due to the action of the connecting spring, thus presetting ribbon reverse.



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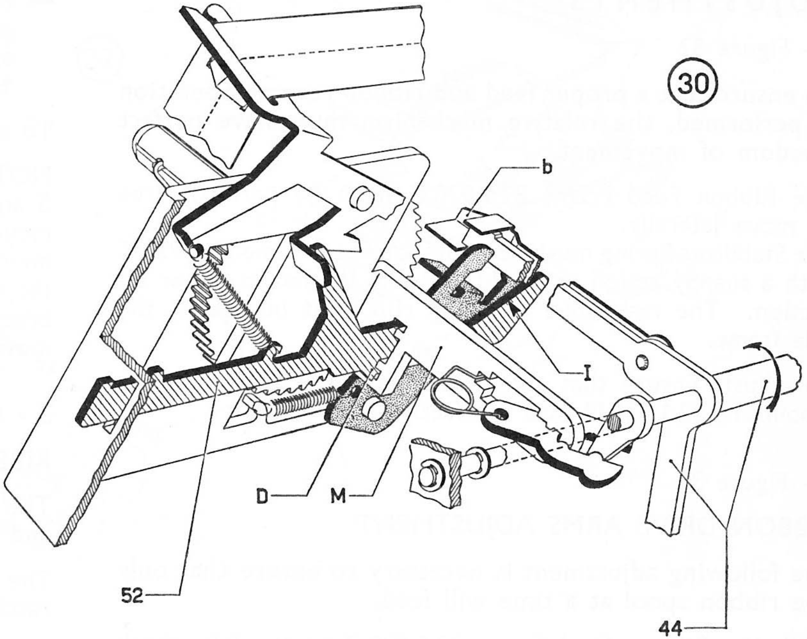
ACTIVATION

Figure 30 illustrates the ribbon reverse mechanism after presetting. The Ribbon Reverse Slide **52** has moved far enough to enable the detent point **D** to relocate over the other side of the slot in the Mounting Bracket **M**.

The subsequent movement of the Ribbon Feed Frame **44** lowers the feed pawl **b**. The arm contacts inclined surface **I** of the Ribbon Reverse Slide **52** and lowers it slightly, thus locking detent **D** against the Mounting Bracket **M**. In this condition, the ribbon reverse slide can not move. The continued downward movement of the arm against the inclined surface **I**, cams the frame **44** to the right. This engages the opposite feed and detent pawls with their respective ratchet wheel.

The lateral movement of the frame **44** is limited by the spring clip K_1. The frame is held in either the left or right position by the toggle spring **S** and stabilizer **53**.

(30)



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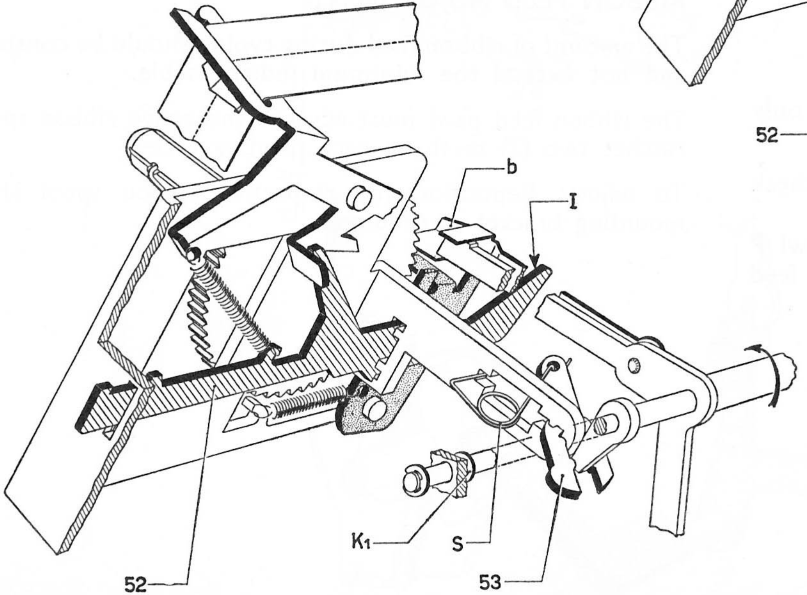

ADJUSTMENTS

1 - Figure 32

To ensure that a proper feed and ribbon reverse operation is performed, the relative mechanism must have perfect freedom of movement.

The Ribbon Feed Frame 32 1 920 Z must be perfectly free to move laterally.
The Stabilizer Spring must move Ribbon Feed Frame 32 1 920 Z with a snappy action and hold it firmly located in either direction. The respective retaining clip must be against the side frame.

To adjust: Ensure that the Feed Frame 32 1 920 Z and the Stabilizer 32 1 921 N are perfectly free.

2 - Figure 32

RIBBON DRIVE ARMS ADJUSTMENT

The following adjustment is necessary to ensure that only one ribbon spool at a time will feed.

With the Ribbon Feed Frame 32 1 920 Z to the left, check the following conditions:

- Arm **S** should hold the feed pawl **B** and detent pawl **P** fully engaged with the ribbon spool ratchet; the feed pawl **B** should be slightly flexed.
- Arm **D** of the ribbon feed frame should hold the right feed and detent pawls clear of the teeth of the right ribbon spool ratchet. With the Ribbon Feed Frame 32 1 920 Z to the right, the above conditions should be reversed.

To adjust: Form either arm **S** or **D** as required.

NOTE - Care should be exercised when forming the arms **S** and **D** so that they do not interfere with the complete movement of the ribbon reverse slide. Restricted movement of the slide during the reversing operation will prevent the detent from relocating on the other side of the mounting bracket. This would result in failure to reverse the ribbon movement.

3 - Figure 32

RIBBON FEED ADJUSTMENT

The amount of ribbon feed during typing should be constant and not exceed the minimum indispensable.

The ribbon feed pawl must advance the active ribbon spool ratchet two (2) teeth on each printing cycle.

To adjust: Reposition the respective ribbon spool shaft mounting bracket as required.

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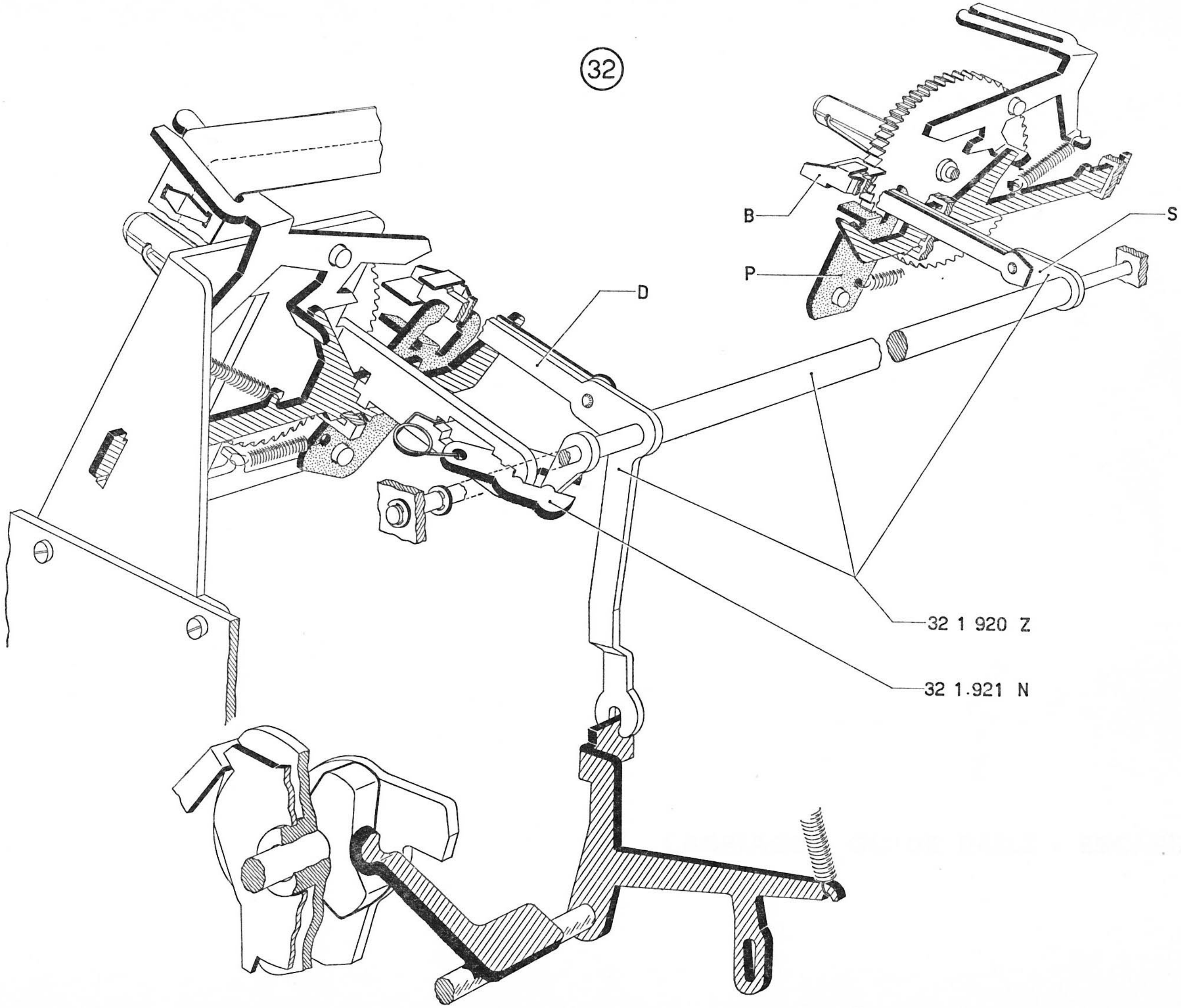

CARRIAGE - GUIDE RAILS - ESCAPEMENT

CARRIAGE AND GUIDE RAILS

FOREWORD

The carriage supports the platen and therefore, provides the correct position of the paper in relation to the printing point. In order to perform its function, the carriage must travel freely and without play between the guide rails attached to the sidewalls of the machine.

GUIDE RAILS

On the Praxis 48 there are two guide rails **R** with a V groove throughout their length.

The front guide rail **R** mounted on the sidewalls of the machine is located against the surfaces **P** and secured in position by four screws **H**.
The rear guide rail **R**, attached to the sidewalls by two screws H_1, is adjustable through the plates **K** and their respective screws.

CARRIAGE STRUCTURE

The carriage frame comprises the following:

— Carriage End Plates **F**.
— Base Plate **T**.
— V grooved Roll Rails **Rm**.

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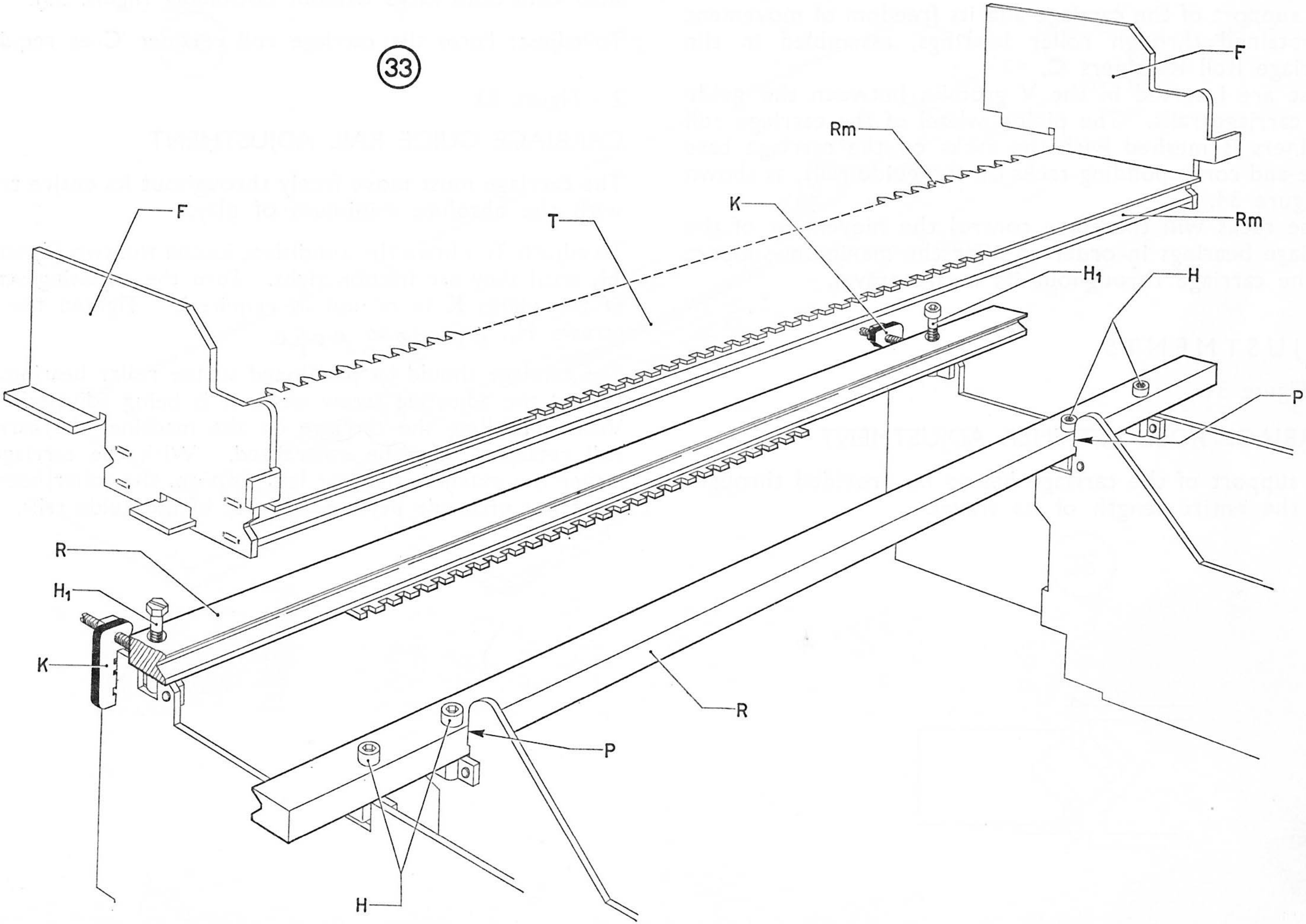


CARRIAGE ROLL BEARINGS

The support of the carriage and its freedom of movement is obtained through roller bearings, assembled in the Carriage Roll Retainers **C**.
These are inserted in the V grooves between the guide and carriage rails. The pinion wheel of the carriage roll retainers is meshed with the racks on the carriage base plate and corresponding racks on the guide rails, as shown in figure 34.
These racks will therefore control the movement of the carriage bearings in order to offer the maximum support to the carriage throughout its entire travel.

ADJUSTMENTS

1 - Figure 34

CARRIAGE ROLL RETAINER ADJUSTMENT

The support of the carriage has to be provided throughout the entire length of its travel.

The carriage roll retainer pinion must mesh as deep as possible with both racks without bottoming (figure 35).

To adjust: Form the carriage roll retainer **C** as required.

2 - Figure 33

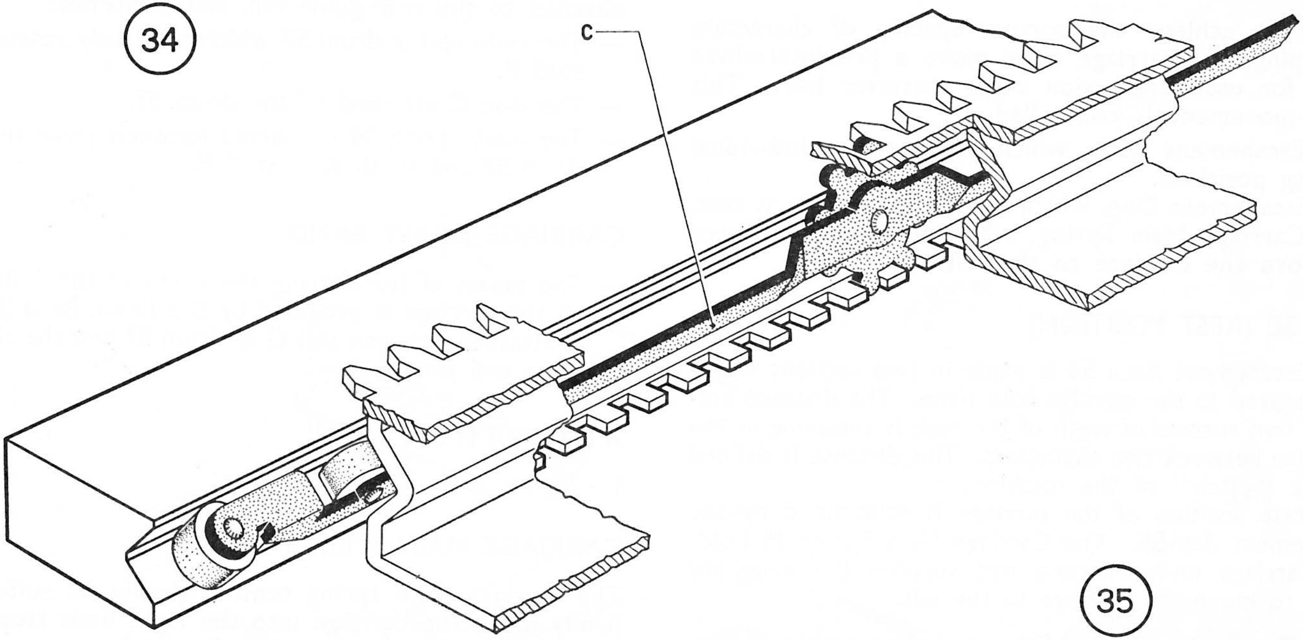
CARRIAGE GUIDE RAIL ADJUSTMENT

The carriage must move freely throughout its entire travel with the absolute minimum of play.

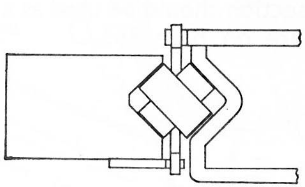
To adjust: To obtain this condition, loosen the two (2) screws H_1 until they are friction tight. Turn the adjusting screws of the plates K in or out as required. Tighten the two screws H_1. previous page

The carriage should be positioned so the roller bearings are behind the adjusting screw while it is being adjusted.
When installing the carriage on the machine, the carriage roll retainers must be centralized. With the carriage in either the extreme right or left position, the roller bearings must not protrude beyond the ends of the guide rails.

34



35



CARRIAGE SPACING AND ESCAPEMENT

FOREWORD

In order to achieve the correct spacing of characters when typing, the carriage must move a pre-determined distance for each depression od a character key. This carriage movement is controlled by:

- **The Escapement Rack, which provides the individual spacing positions.**
- **The Escapement Dog, which holds the carriage at rest.**
- **The Carriage Main Spring, which furnishes the force to move the carriage to the left.**

CARRIAGE (REST POSITION)

- The Escapement Rack **54** is made in two sections which are secured to the carriage base plate. The distance between two successive teeth of the rack is the same as the distance between two characters. This distance is defined as the " pitch " of the machine.
  The rest position of the carriage is established by the escapement dog **55**. The Carriage Main Spring **M** holds the carriage under tension and supplies the necessary force to move the carriage to the left.

NOTE - The exact position of the escapement racks is established by a gauge at the factory and then pinned.
Should it become necessary to replace one of the two sections, the remaining section should be used as a reference, as covered in the procedure on page 365.

CARRIAGE MAIN SPRING

The Carriage Main Spring assembly **56** is mounted on a bracket attached to the rear guide rail, and comprises:

- The main spring drum **57** which can freely rotate on the stud **P**.
- The disc **C** attached to the drum **57**.
- The main spring **M** connected between projection **H** of drum **57** and tooth **K** of stud **P**.

CARRIAGE DRAW BAND

- The means of transferring the enery of the main spring to the carriage is provided by the Draw Band **58**. This is attached between slot **G** of drum **57** and the right carriage end plate.

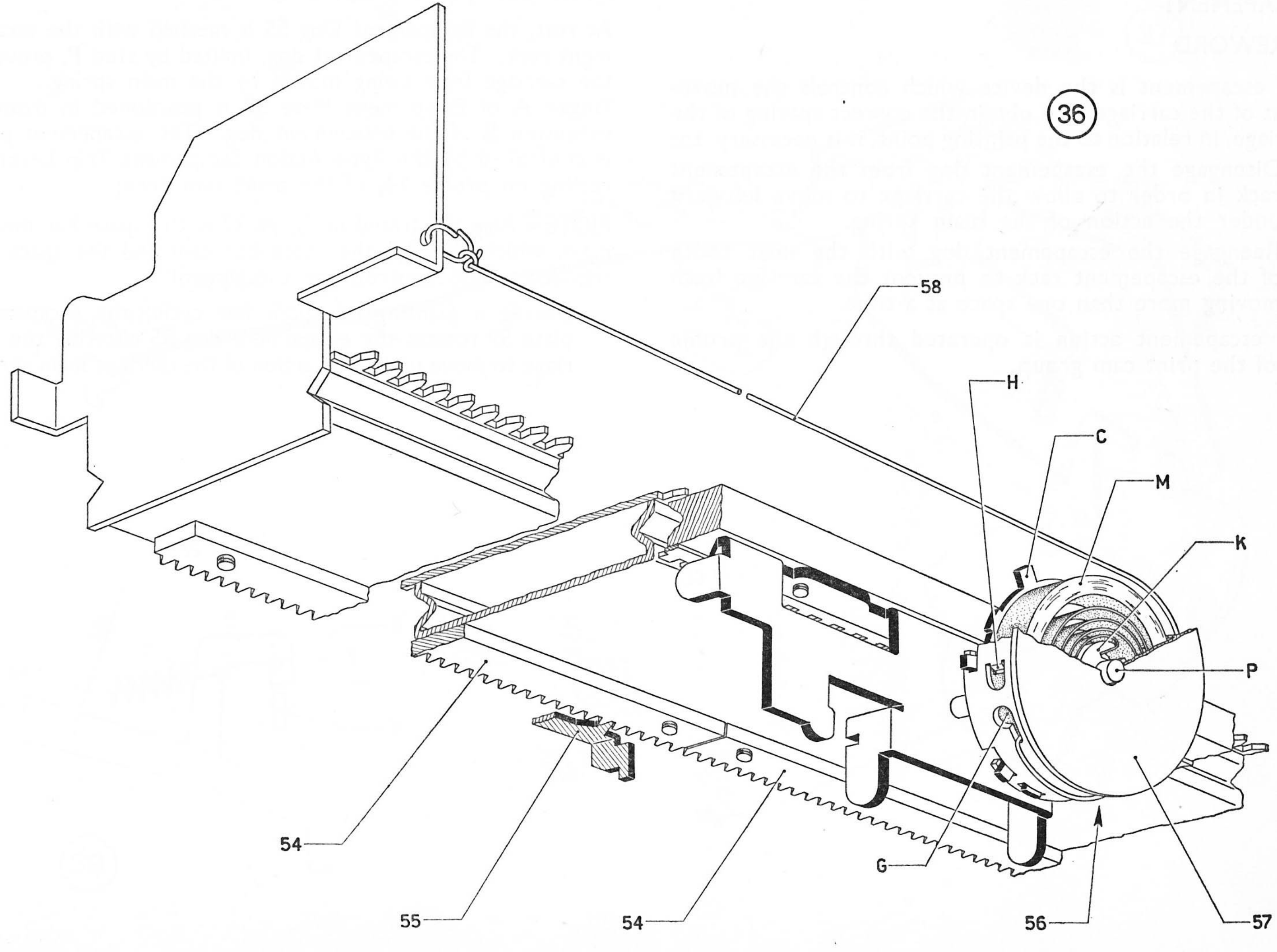
ADJUSTMENTS

1 - Figure 36

CARRIAGE MAIN SPRING TENSION

The carriage main spring tension should be sufficient to firmly move the carriage into the right limit stop during normal typing and operate the line lock.

To adjust: Unhook the carriage draw band **58** and rotate the main spring drum **57** approximately eight complete turns. Re-hook carriage draw band **58**.


36
58
H
C
M
K
P
54
55
54
G
56
57

ESCAPEMENT

FOREWORD

The escapement is the device which controls the movement of the carriage. To obtain the correct spacing of the carriage, in relation to the printing point, it is necessary to:

- Disengage the escapement dog from the escapement rack in order to allow the carriage to move leftward under the action of the main spring.
- Reengage the escapement dog with the next tooth of the escapement rack to prevent the carriage from moving more than one space at a time.

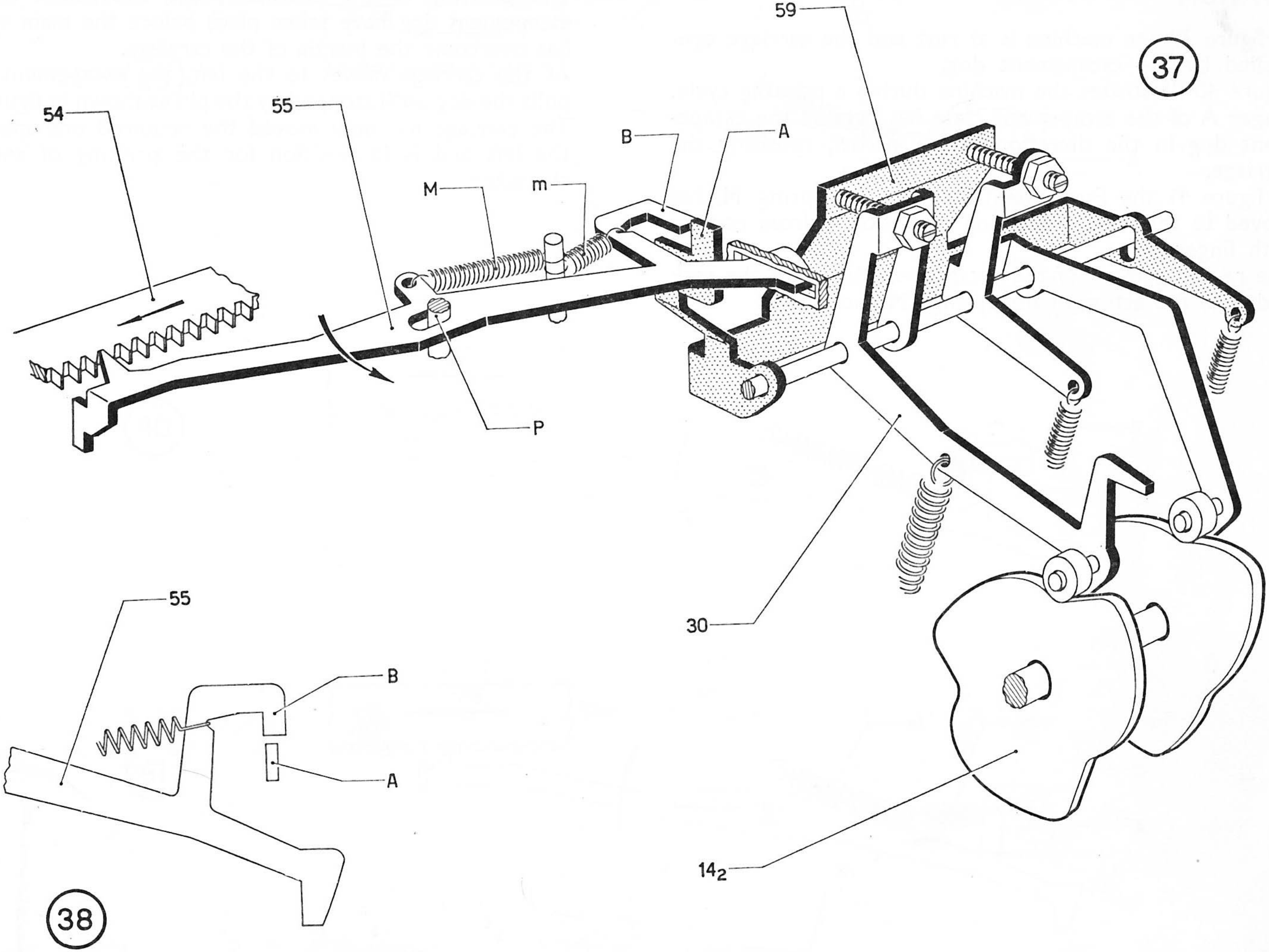
The escapement action is operated through the profile **14_2** of the print cam group.

ASSEMBLY (REST POSITION)

At rest, the Escapement Dog **55** is meshed with the escapement rack. The escapement dog, limited by stud **P**, prevents the carriage from being moved by the main spring.
Finger **A** of Escapement Plate **59** is positioned in front of extension **B** of the escapement dog. The escapement plate is controlled by the Type Action Escapement Trip Lever **30** resting on profile **14_2** of the print cam group.

NOTE - Also illustrated in figure 37 is the space bar mechanism, which through the space bar cam and the space bar trip lever, also controls the escapement.

- During a printing or space bar cycle, the escapement plate **59** rotates the escapement dog **55** allowing the carriage to move under the action of the carriage main spring.



37

38

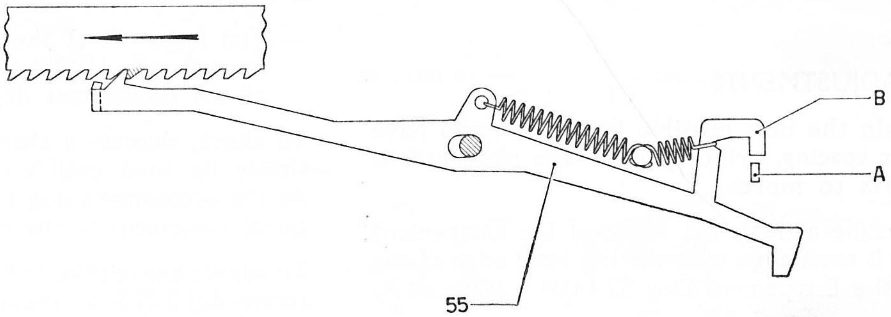
ACTIVATION

- In figure 39 the machine is at rest and the carriage controlled by the escapement dog.
- Figure 40 illustrates the machine during a printing cycle. Finger **A** of the escapement plate has rotated the escapement dog in the direction of the arrow, releasing the carriage.
- In figure 41 the Escapement Dog, due to spring **M**, has moved to the right, removing extension **B** from contact with finger **A**.

  The re-engagement of the escapement dog with the rack is due to the action of the springs **M** and **m**.
- The printing of the character, and movement of the escapement dog have taken place before the main spring has overcome the inertia of the carriage.

  As the carriage moves to the left, the escapement rack pulls the dog until stopped by the pin as shown in figure 39. The carriage has now moved the required one space to the left and is in position for the printing of another character.

㊴



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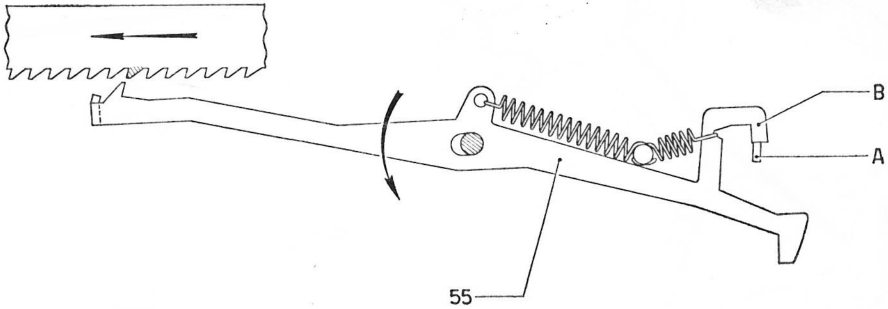

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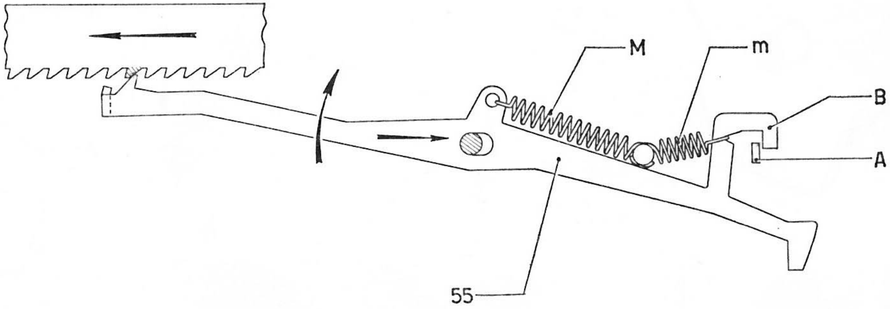


ADJUSTMENTS

1 - Figure 43

ESCAPEMENT ADJUSTMENTS

In order to obtain the best possible impression and have correct character spacing, printing must take place before the carriage starts to move.

— With the machine at rest, the finger of the Escapement Plate 32 1 000 B must align with the left hand edge of the extension of the Escapement Dog 32 1 004 T (Line **XX**, figure 43).

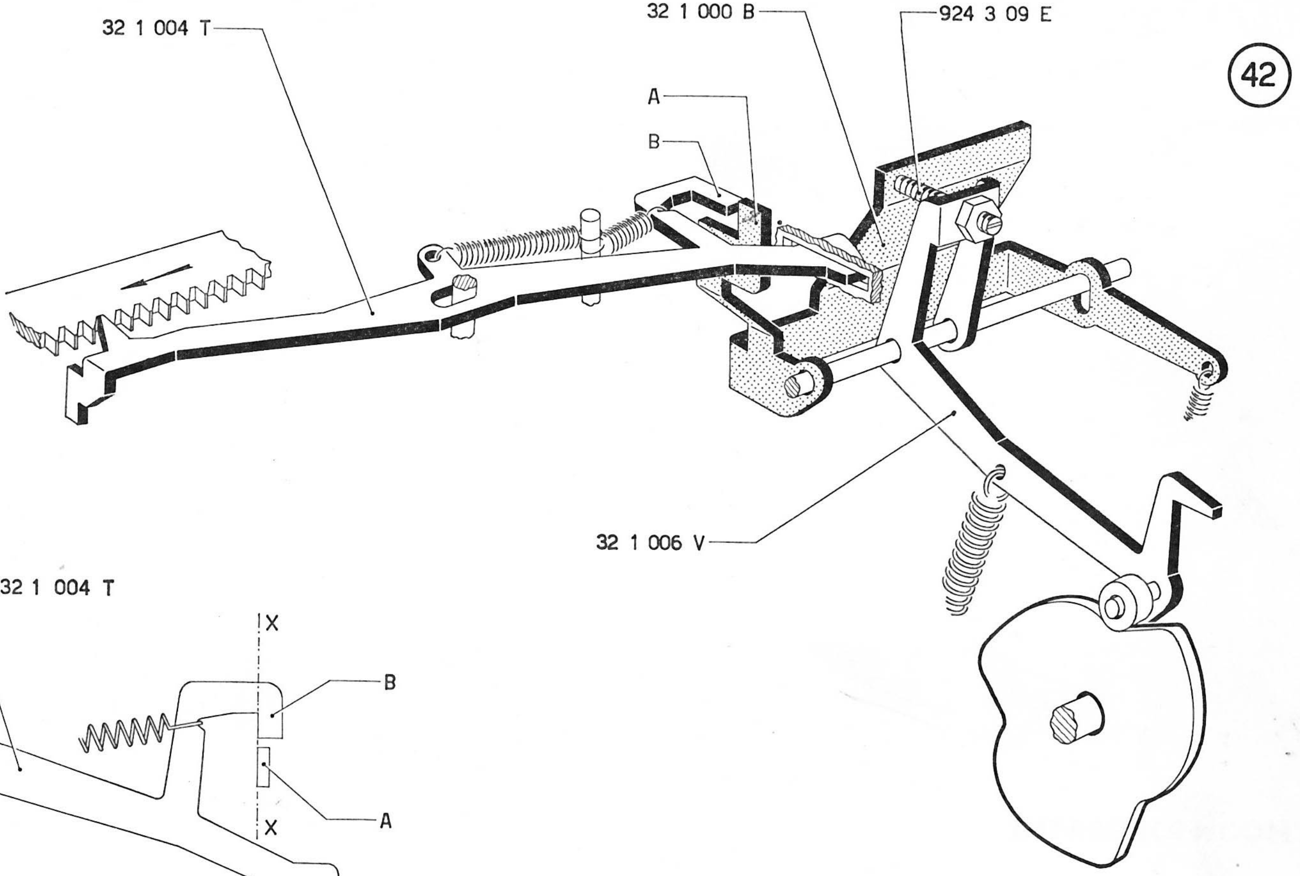
To adjust: Form the finger **A** of the Escapement Plate 32 1 000 B as required.

2 - Figure 42

— The finger **A** of the Escapement Plate 32 1 000 B must have .3 mm. (.012") additional movement after the tooth of the escapement dog leaves the rack.

To check, depress a character key, rotate the power shaft slowly by hand until escapement trip occurs.
As the escapement dog moves rightward, observe the additional movement to the rear .3 mm. (.012") of finger **A**.

To adjust: Loosen the lock nut and regulate the trip adjusting screw 924 3 09 E as required, tighten lock nut.



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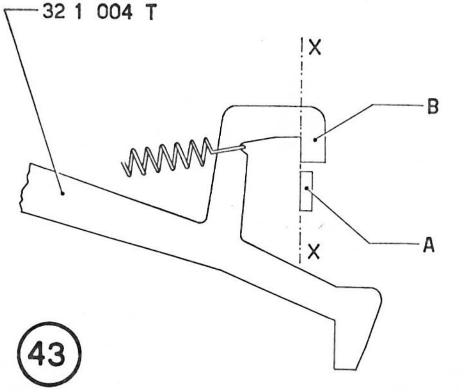


㊸

IMPRESSION CONTROL

IMPRESSION CONTROL

FOREWORD

The impression control is provided in order to conform to the two basic types of typewritten work:

— Regular correspondence.
— Multiple copy work.

Review of figures 15 and 16 will show that the type bar was raised by the printing spring **M**. The force of impact, or impression of the character on the paper, was controlled by the opposing action of the impression control spring **m**. The impression of all characters can be increased or decreased by altering the action of the printing spring **M**.

ASSEMBLY

The Printing Spring **M** is connected between lever **64** and anchor **61**. The position of the lever **64** on the type action bail arm **27** will alter the action of spring **M** on the type action bail **36**.

Impression control at maximum.

Figure 44 illustrates the impression control mechanism in the position of maximum, with lever **64** in the lower notch of the Type Action Bail Arm **27**.
In this position the printing spring furnishes its maximum action through the increased mechanical leverage.

Impression control at minimum.

Rotation of the Impression Control Key, through link **65** and Impression Control Bridge **63**, will raise the lever **64** to the upper notch. The energy transferred from the printing spring to the Type Action Bail **36** will consequently be reduced through the decreased mechanical leverage.

ADJUSTMENTS

1 - Figure 44

IMPRESSION CONTROL BRIDGE ADJUSTMENT

During typing, the pin of the lever **64** must move freely in the slot of the Impression Control Bridge **63** without interference. This applies with the impression control key set at either minimum or maximum position.

To adjust: Open or close the **U** shaped slot of the Impression Control Bridge **63** as required.

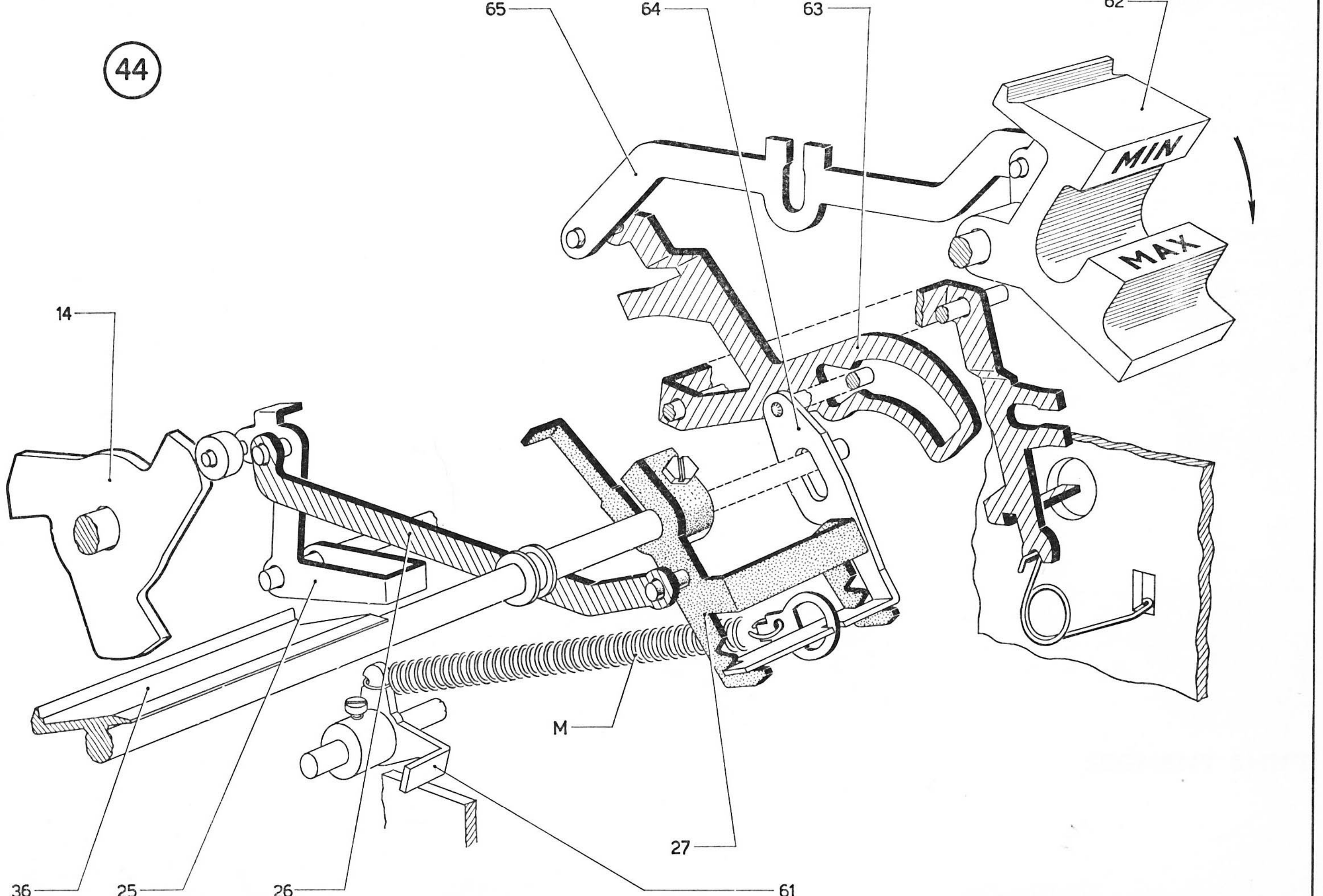
2 - Figure 44

IMPRESSION CONTROL KEY REST POSITION

The impression control key **62**, set at minimum, should align with the ribbon selector key set at black.

To adjust: Open or close the **U** shaped slot of the link **65** as required.

(44)



SEGMENT SHIFT

FOREWORD

The type slug on each type bar has two printing surfaces, **M** and **m** (figure 45).

The characters in position **M** are known as upper case (capital letters).

The characters in position **m** are known as lower case (small letters).

The normal rest position of the segment is in the lower case position.

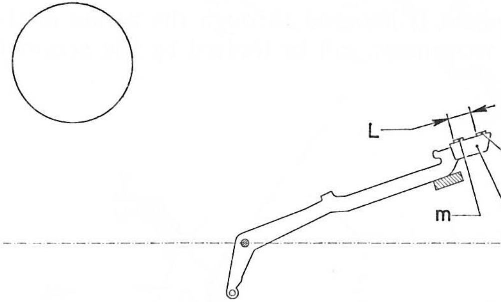
To print either the upper or lower case characters on the same writing line, it is necessary to move the segment up or down (figures 46 and 47).

The distance **L** (figure 45) through which the segment moves in a shift operation is known as the motion.

The shift of the segment is controlled from the keyboard by depressing the Shift Key.

In order for the segment to move from lower to upper case position, or vice versa, the shift key must operate the command mechanism. This will cause the actuating mechanism to move the segment in the required direction.

㊺



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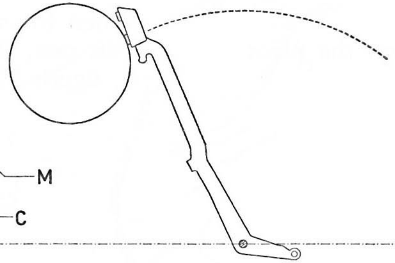

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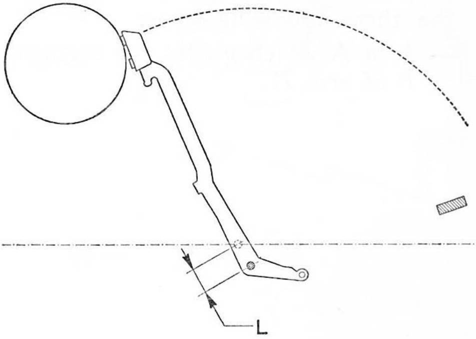


SEGMENT

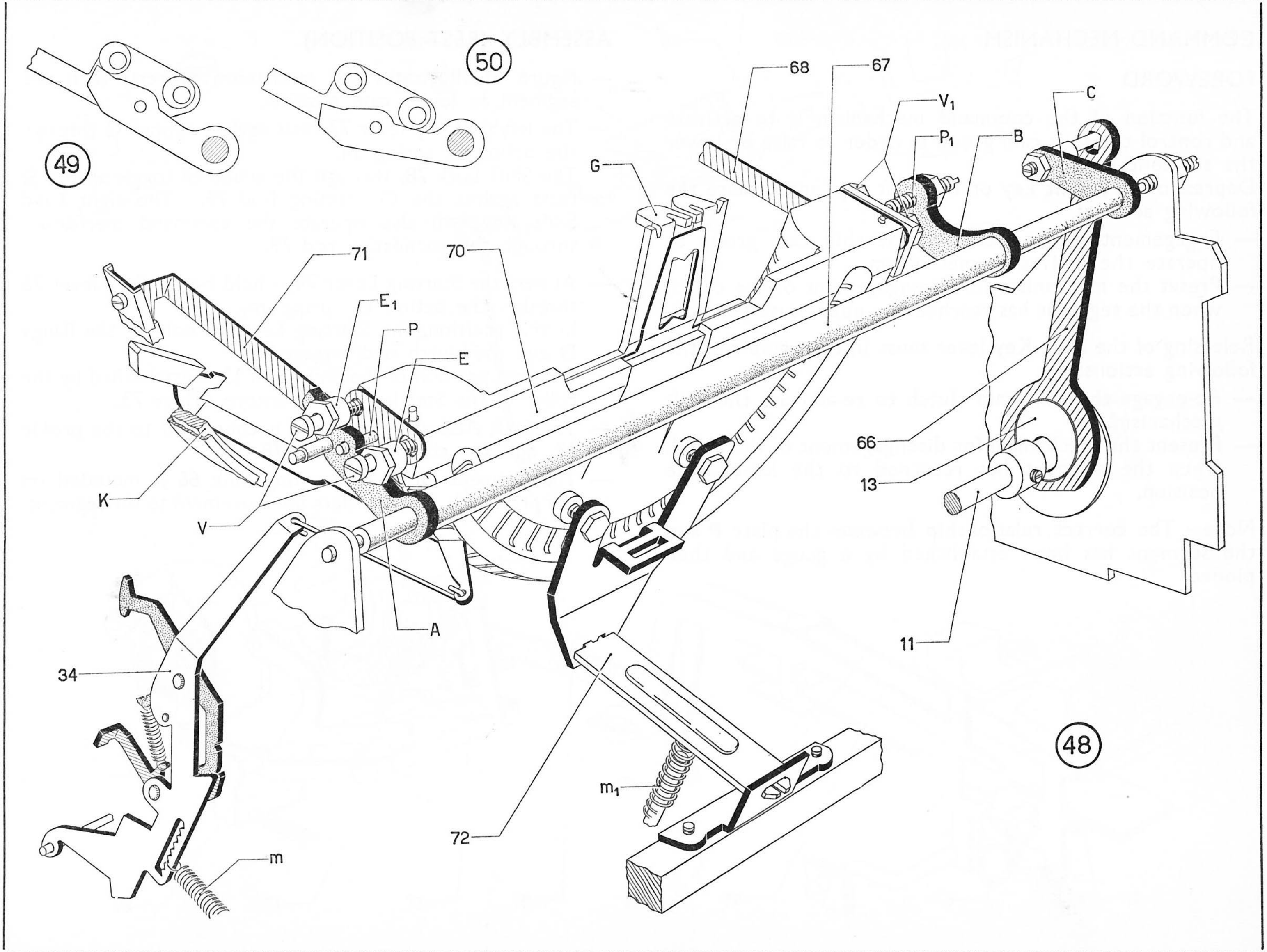
ASSEMBLY

The segment assembly comprises the following:

- The Segment **70**, which controls the type bars.
- The Type Bars, which are held in the segment slots by a fulcrum wire on which they pivot.
- Type Bar Nest **K**, which supports the type bars at rest, and is attached to the segment by:
  - Arm **68**, fastened by screws **V_1**.
  - Arm **71**, fastened by screws **V**, which in turn lock the eccentrics **E** and **E_1**.
- The Shift Shaft **67**, mounted between the internal side-walls of the machine, holds and guides the segment through the three following arms:
  - Arm **A** which guides the segment through the pivot **P** of arm **71**.
  - Arm **B** which houses the adjustable pivot **P_1** of the segment located in the plate secured to the segment.
  - Arm **C** which operates the segment movement through the eccentric stud, connecting arm **66**, and Shift Cam Group **13**.
- The Lower Segment Guide **72** establishes the angle of the segment **70**.

In conclusion, the segment **70** is guided by the arms **A** and **B** of the segment shift shaft **67** and the lower guide **72**.

- The figure 48 illustrates the segment in lower case, held in this position by the combined tension of the Bell Crank springs **m**, together with the spring **m_1**.
- The lower case limit stop is the eccentric **E_1** in conjunction with Arm **A**, figure 49.
- When the segment is lowered through the action of the shift cam, the movement will be limited by the eccentric **E**, figure 50.


49
50
68
67
C
V_1
P_1
B
G
71
70
E_1
P
E
66
13
K
V
A
11
34
72
m_1
m
48

COMMAND MECHANISM

FOREWORD

The function of the command mechanism is to activate and control the shift cam group in order to raise or lower the segment.
Depression of a shift key or the shift lock must cause the following actions:

- Engagement of the clutch of the shift cam group to operate the activation mechanism.
- Preset the mechanism for disengagement of the clutch when the segment has reached the upper case position.

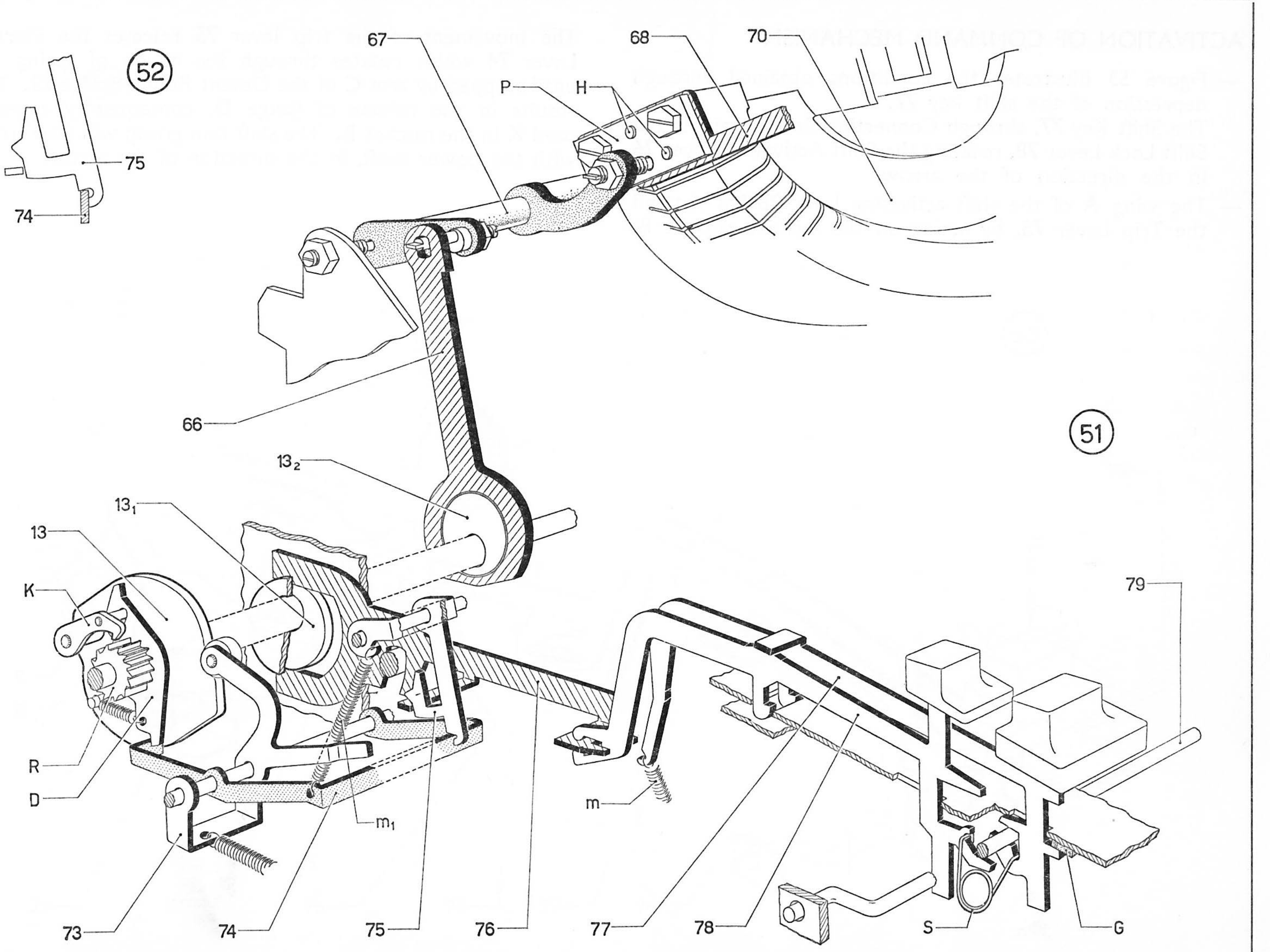
Releasing of the Shift Key lever must in turn result in the following actions:

- Re-engage the shift cam clutch to re-activate the shift mechanism.
- Present the mechanism for disengagement of the clutch when the segment has returned to the lower case position.

Note - The correct relationship between the plate **P** and the segment has been established by a gauge and then pinned.

ASSEMBLY (REST POSITION)

- Figure 51 illustrates the mechanism at rest, with the segment in lower case position.
- The left shift key lever **77** rests against rubber **G** through the action of spring **m**.
  The Shift Lock **78**, through the action of toggle spring **S**, rests against the Connecting Rod **79**. The right hand Shift Key will also operate the command mechanism through the connecting rod **79**.
- At rest the Starting Lever **74** is held by the Trip lever **75** through the action of spring m_1.
  In this position, the Starting Lever is holding the flange **D** and the clutch is disengaged.
  The rest position of the Shift Cam **13** is established by the roller of the Starting Lever Restore Bridge **73**.
- The Shift Activating Lever **76** is connected to the profile 13_1 and the shift lock lever **78**.
- The Segment Drive Connecting Link **66** is mounted on the profile 13_2, and transfers the movement to the segment.

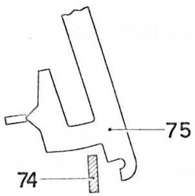

(52)
75
74
67
68
70
P
H
66
13_2
13_1
13
K
R
D
79
m
m_1
73
74
75
76
77
78
S
G
(51)

ACTIVATION OF COMMAND MECHANISM

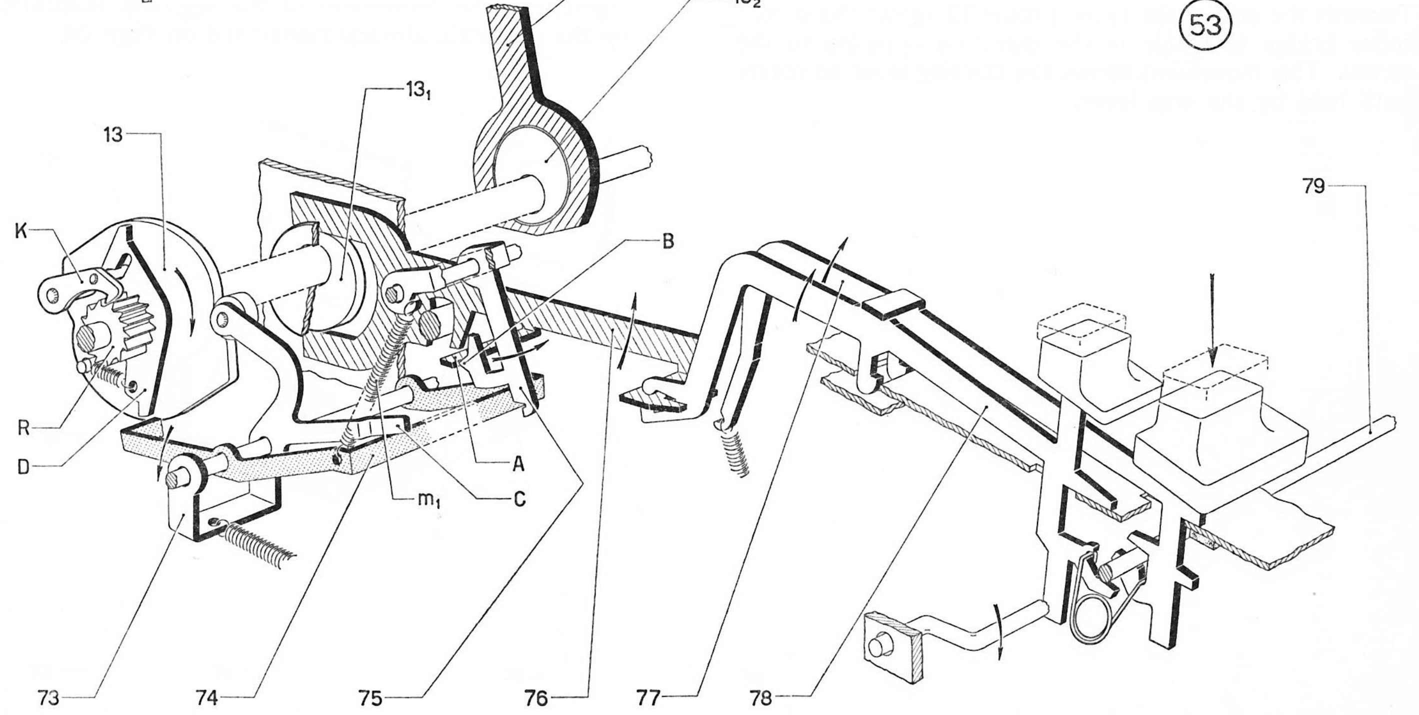
- Figure 53 illustrates the conditions obtained through depression of the shift key **77**.
  The Shift Key **77**, through Connecting Rod **79**, pivots the Shift Lock Lever **78**, rotating the Shift Activating Lever **76** in the direction of the arrow.
- The wing **A** of the shift activating lever **76** has rotated the Trip Lever **75**, by acting on the inclined surface **B**.

The movement of the trip lever **75** releases the Starting Lever **74** which rotates through the action of spring m_1, until stopped by arm **C** of the Detent Roller Bridge **73**. This results in the release of flange **D**, consequently engaging pawl **K** in the ratchet **R**. The shift cam group will now rotate with the power shaft, in the direction of the arrow.

54



53



PRESETTING THE STOPPING OF THE SHIFT CAM

— Figure 55 illustrates the mechanism before the completion of 180° rotation of the shift cam group.
Profile **13_1** has raised wing **A** of the Shift Activating Lever **76** above the high point **B** of the Trip Lever **75**. As a result, the trip lever rotates until stopped by the starting lever **74** (figure 56).
Profile **13** has rotated the Detent Roller Bridge **73**, restoring the starting lever in the direction of the arrow.
The starting lever is now in the path of flange **D** which, at 180° rotation, will stop the shift cam group.

— Towards the end of the cycle, profile **13** allows the detent roller bridge to rotate in the direction opposite to the arrow. This movement allows the starting lever to rotate until held by the trip lever.

ACTIVATION

The activation of the shift mechanism, during the movement from lower to upper case, must perform the following functions:

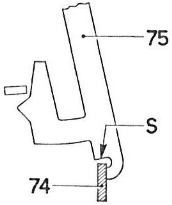
— Lower the segment.

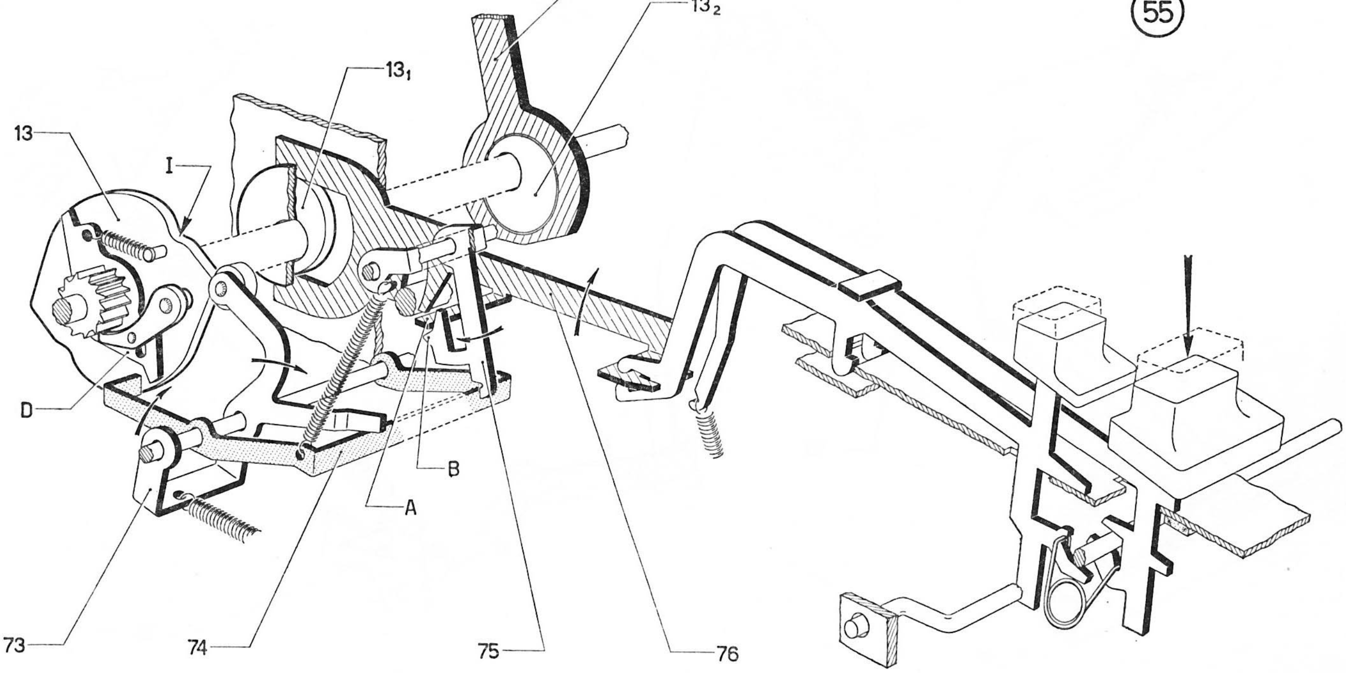
— Increase the tension of the printing spring.

MOVEMENT OF THE SEGMENT

— At the completion of 180° rotation, profile **13_2** will have lowered the Shift Drive Link **66** and consequently the segment. The movement of the segment is controlled by the eccentric already mentioned on Page 84.

56





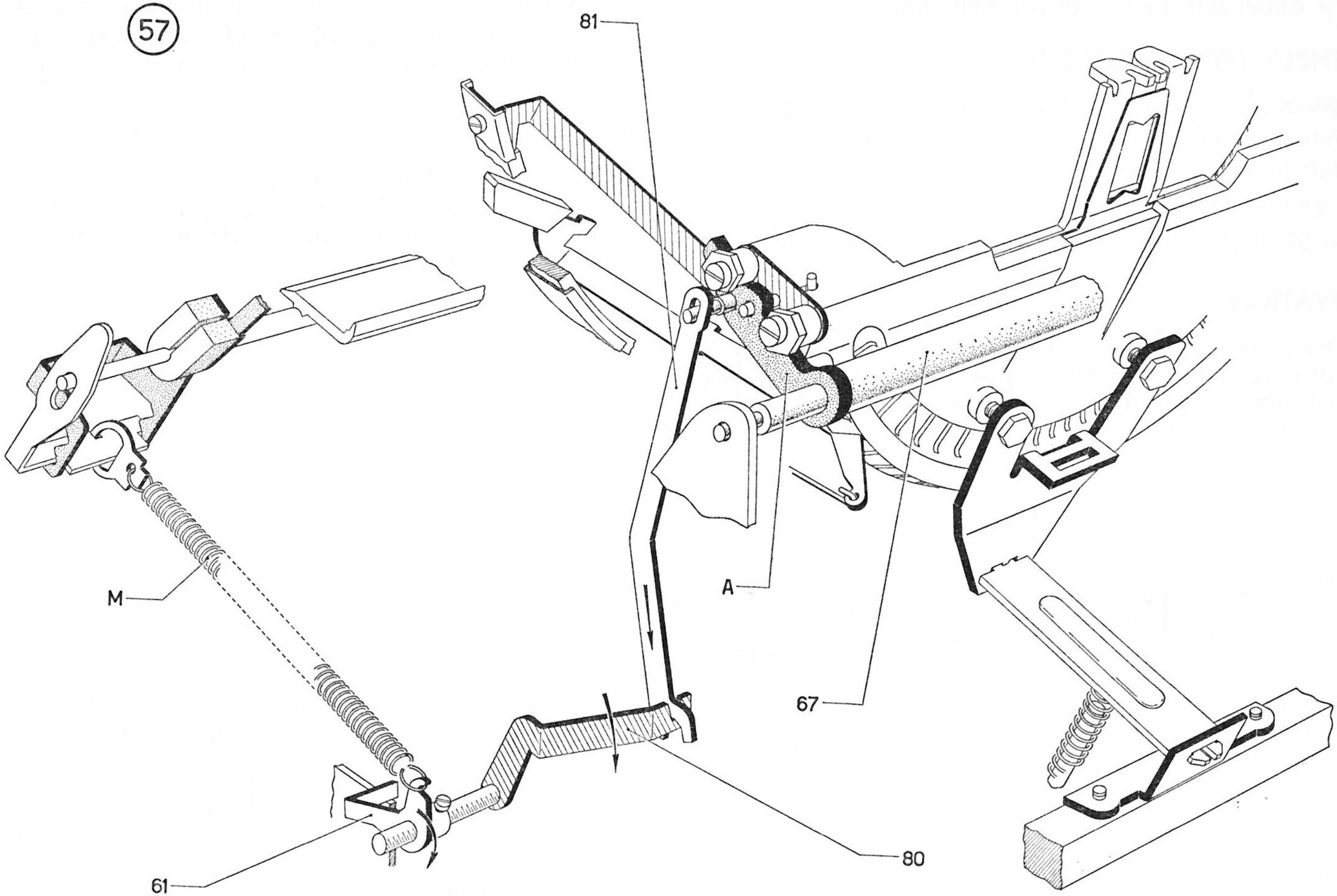
55

AUTOMATIC IMPRESSION COMPENSATION

In general, the surface area of an upper case character is larger than that of the corresponding lower case character. This larger surface area requires more power from the printing spring to give an impression equal in density to that of the lower case letter. This is accomplished automatically when moving from lower to upper case during the segment shift operation.

As the segment moves down, the stud on arm **A** pushes down link **81**. This rotates crank **80** to which is attached the Printing Spring Anchor **61**. The rotation of the crank and the printing spring anchor in the direction of the arrow increases the tension of the Printing Spring **M**.

57



SHIFT LOCK

Continuous typing with the segment in upper case position is obtainable by use of the Shift Lock.

ASSEMBLY (REST POSITION)

The parts which provide the shift lock function are:

- Shift lever **77**.
- Shift lock lever **78**.
- Toggle spring **S**.

Figure 59 illustrates these parts in their rest position.

ACTIVATION

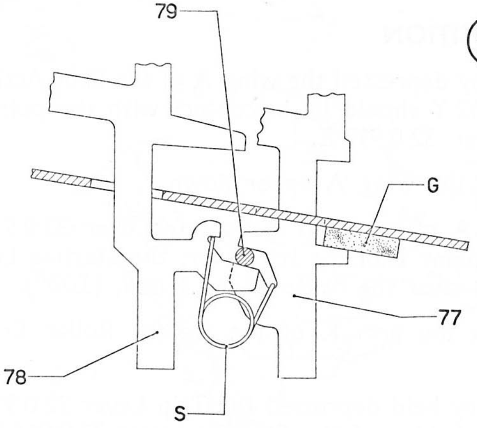
Depression of the shift lock key causes the lever **78** to pivot until its extension **T** contacts the upper plate of the keyboard housing (figure 58 and 60).

At the completion of the shift key depression:

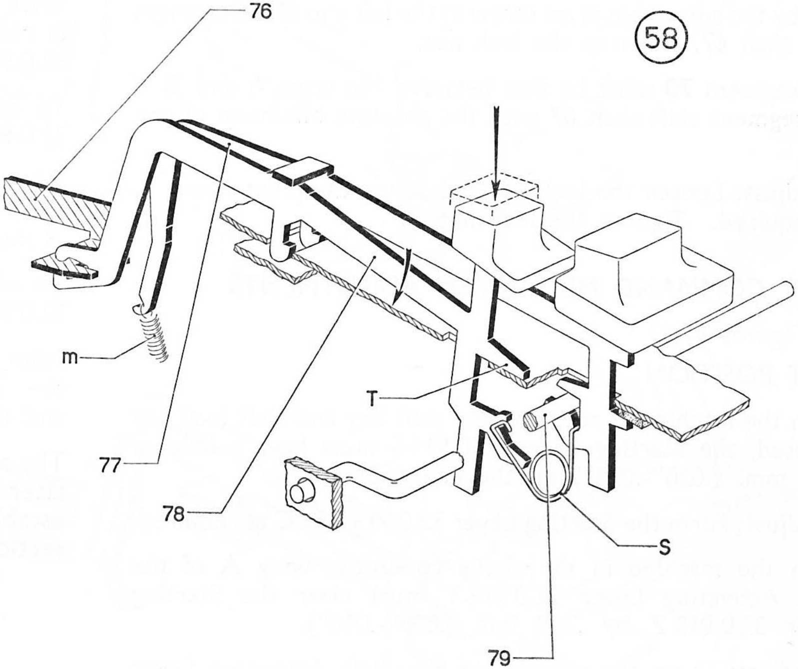
- Lever **78** is maintained in position by the directional change of action which the Toggle Spring **S** is now exerting.
- Shift activating lever **76** provides the disengagement of the shift cam clutch at 180° rotation of the shift cam.

RESTORE

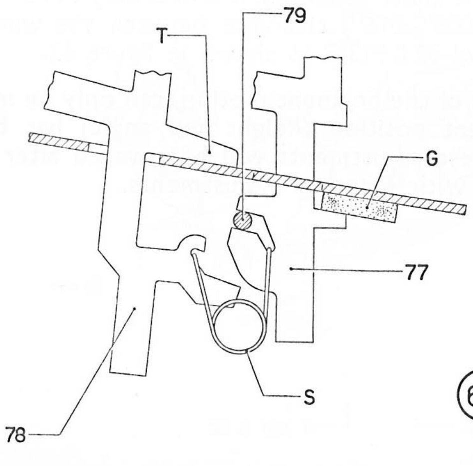
To enable the shift lock mechanism to return to rest, a shift key must be depressed. The Toggle Spring **S** will then return to its former position, resuming its original action on the levers **77** and **78**.



(59)



(58)



(60)

ADJUSTMENTS

1 - Figure 48

SEGMENT ADJUSTMENTS

The segment shift shaft **67** must be free to pivot without end play.

To adjust: Loosen the lock nut and regulate shift shaft end play by the adjustable pivot screw at the left end of the segment shift shaft **67**. Tighten the lock nut.

The segment **70** must be free between the arms **A** and **B** of the segment shift shaft **67** with the absolute minimum of end play.

To adjust: Loosen the lock nut and adjust the pivot screw $\mathbf{P_1}$ as required. Tighten the lock nut.

SHIFT COMMAND MECHANISM ADJUSTMENTS

2 - Figures 61-62

REST POSITION

With the machine at rest, and the shift key and shift lock key released, the Starting Lever 32 0 914 S must have a hold of .5-.7 mm. (.020"-.028") on the flange **D**.

To adjust: Form the Starting Lever 32 0 914 S at **C** as required.

With the machine in the above condition, wing **A** of the Shift Activating Lever 32 0 912 Y must clear the Starting Lever 32 0 913 Z by .2-.4 mm (.008"-.016").

To adjust: Form the wing **A** of the Shift Activating Lever 32 0 912 Y forward or rearward as required.

3 - Figures 63-64

OPERATIVE POSITION

With the shift key depressed the wing **A** of the Shift Activating Lever 32 0 912 Y should be in contact with the point **B** of the Trip Lever 32 0 913 Z.

To adjust: Form the wing **A** up or down.

With the wing **A** of the Shift Activating Lever 32 0 912 Y in contact with point **B** of the trip lever, the Starting Lever 32 0 914 S should clear the flange **D** by .5 mm. (.020").

To adjust: Form the arm **K** of the Detent Roller Bridge 32 0 915 T.

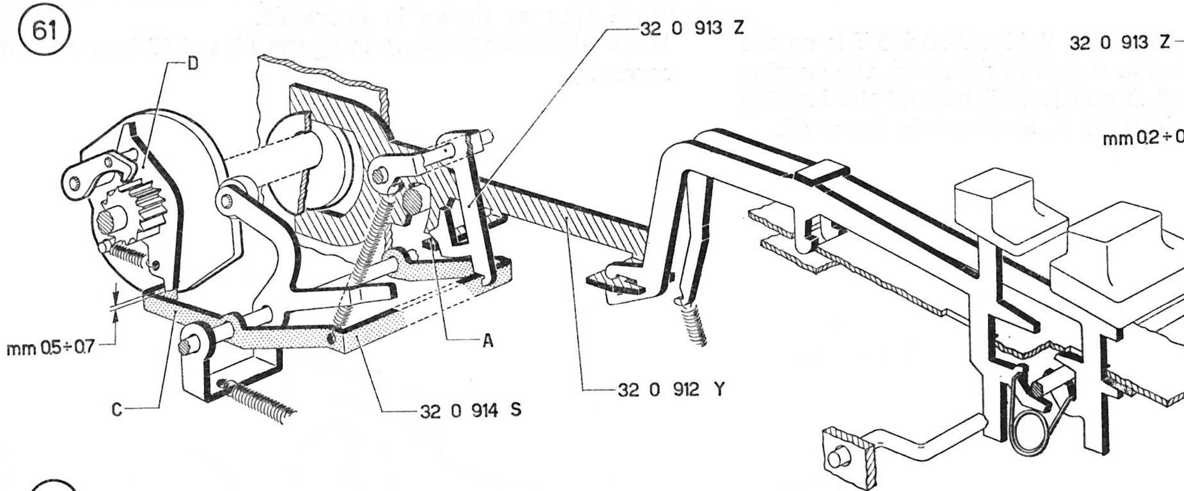
With the shift key held depressed the Trip Lever 32 0 913 Z should clear the bridge of the Starting Lever 32 0 914 S by .3 mm. (.012").

To adjust: Form the wing **A** of the Shift Activating Lever 32 0 912 Y.

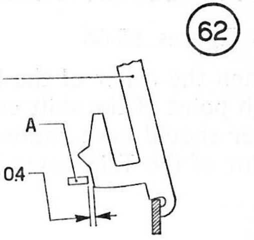
After obtaining the above condition, it is necessary to re-check the .2-.4 mm. (.008"-.016") clearance between the wing **A** and the Trip Pawl 32 0 913 Z as shown in figure 62.

The adjustments of the Segment motion, can only be made after the segment position (height and angle) has been established. These adjustments will be covered after the section dealing with Printing Adjustments.

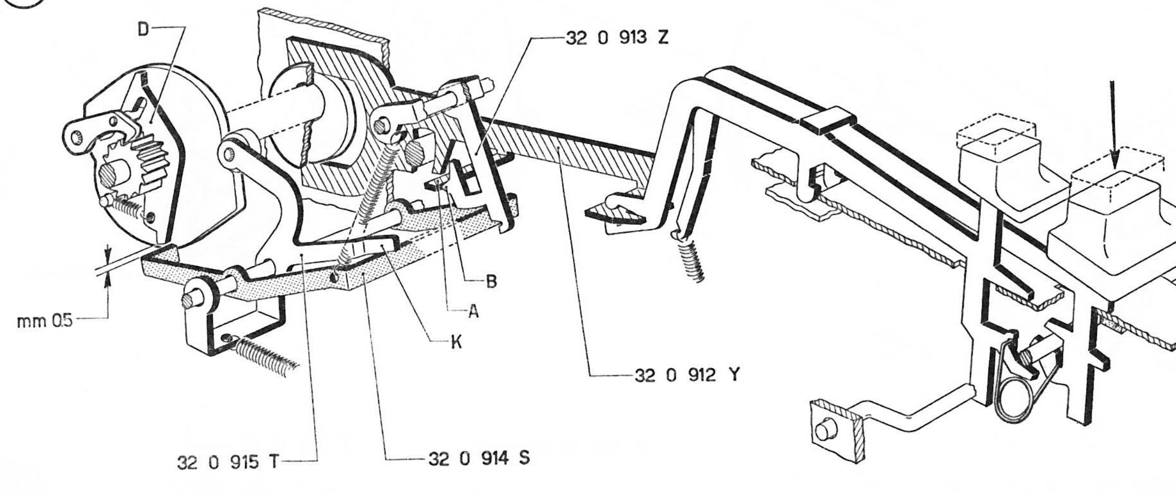
(61)


D
32 0 913 Z
A
mm 0,5÷0,7
C
32 0 914 S
32 0 912 Y

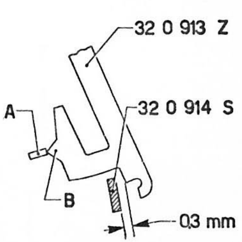
(62)


32 0 913 Z
A
mm 0,2÷0,4

(63)


D
32 0 913 Z
B
A
K
mm 0,5
32 0 912 Y
32 0 915 T
32 0 914 S

(64)


32 0 913 Z
A
32 0 914 S
B
0,3 mm

SHIFT CLUTCH CONTROL ADJUSTMENT

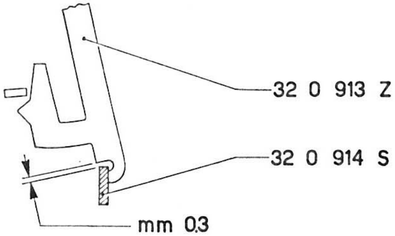
4 - Figures 65-66

When the roller of the Restoring Bridge 32 0 915 T is on the high point of the shift cam as shown in figure 65, the starting lever should have rotated .3 mm (.012″) beyond the latching point of the Trip Lever 32 0 913 Z, as shown in figure 66.

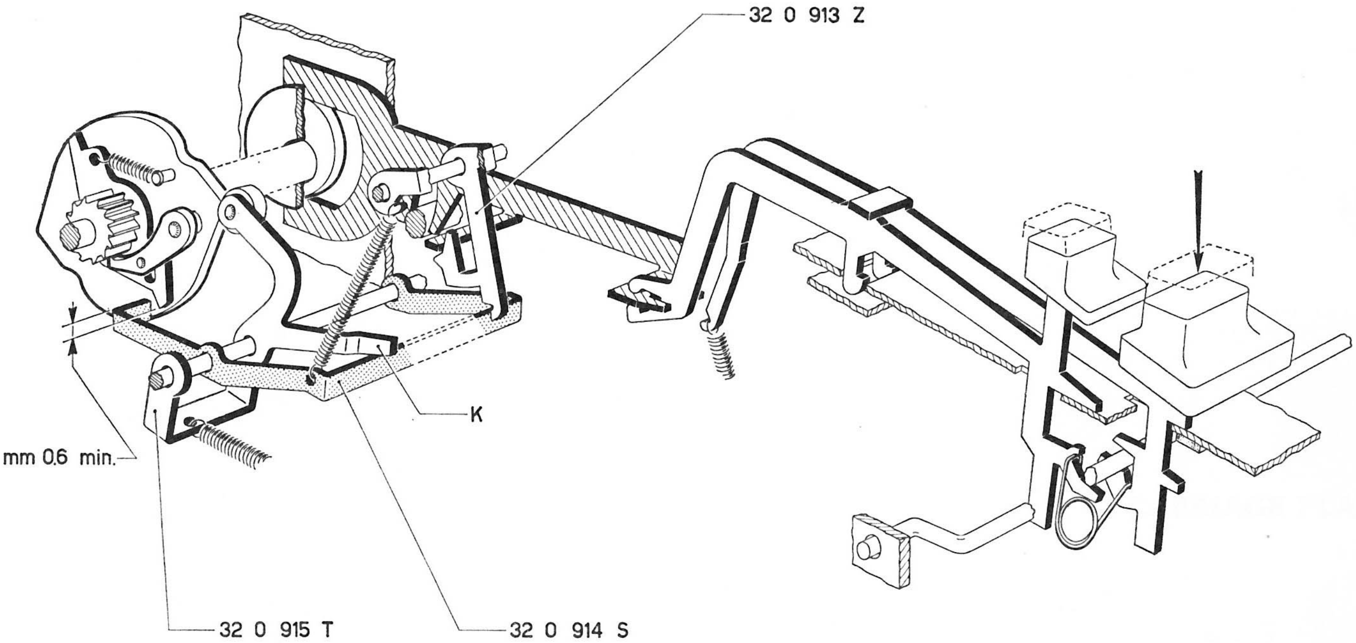
The wing of the starting lever must be in the path of flange **D** and a minimum of .6 mm (.024″) above the bottom of the flange spur as shown in figure 65.

These adjustments shown in figures 61 and 63 have been made correctly.

(66)



(65)



CARRIAGE PLATEN

PLATEN

The platen is cradled between the carriage end plates; its two end Bushings **K** are supported at each end by the two adjustable plates **60** and **69**.
The lateral position of the platen is stabilized by the Guide Bracket **P**, the top of which is positioned in the groove of the platen shaft.
The platen is locked in position by the Platen Lock Arm Assembly **A**, **B** and **C** left and right.

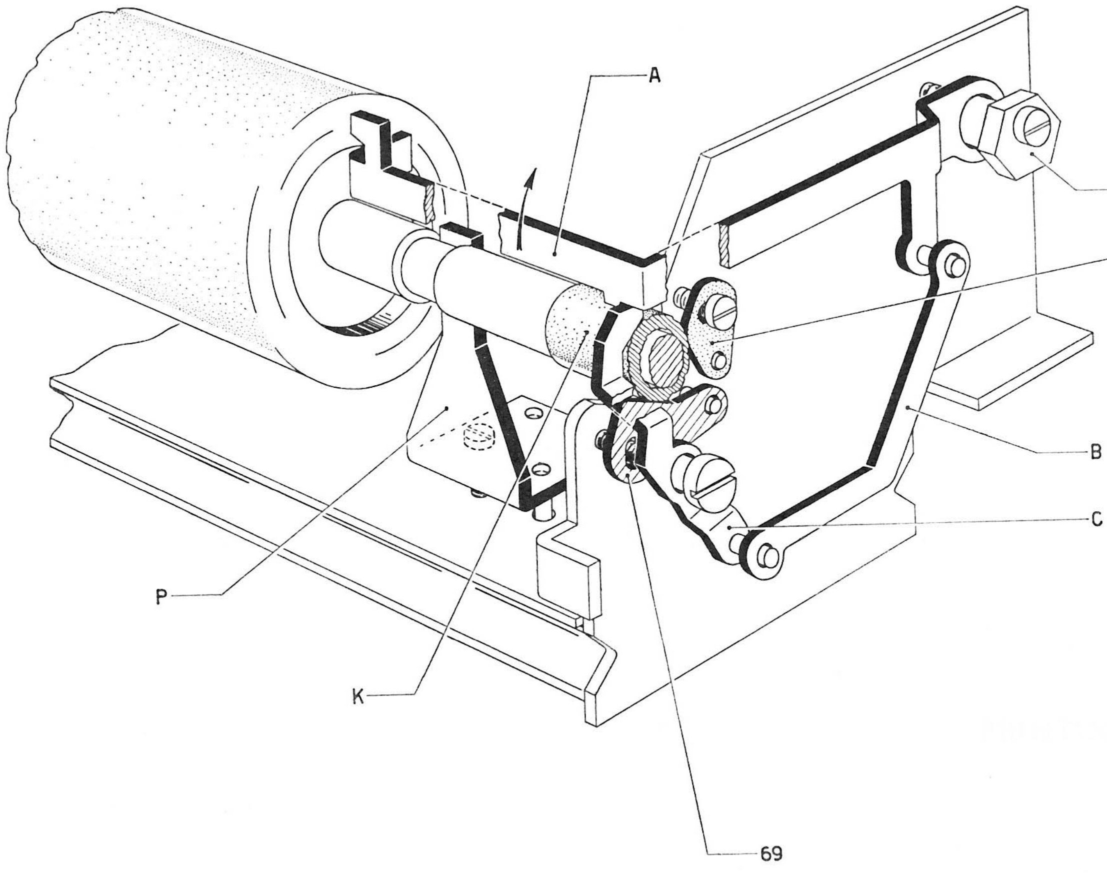
The Plate **69** establishes the height of the platen (type on feet) and the Plate **60** establishes the front to rear position (ring and platen).

ADJUSTMENTS

1 - Figure 67

The Platen Bushings **K** must be firmly held against the two Plates **60** and **69** by the Frame **A**, **B**, **C** through eccentrics **E**. Since the positioning of plates **60** and **69** can only be established after the segment position is determined, these adjustments will be covered in the section on Printing Adjustments.

67



PRINTING ADJUSTMENTS

FOREWORD

The following section will cover the mechanisms and the adjustments needed to achieve perfect printing.
It must be pointed out that, the final objective is a typewritten work produced with the best possible alignment and uniformity of impression. Despite the fact that the closest manufacturing tolerances are maintained, these adjustments will only result in the best working condition for the majority of characters. The final objective may require the adjustment of individual type bars.

GENERAL CONSIDERATIONS

Figure 68 illustrates in schematic form, the mechanisms responsible for producing the outstanding quality of work achievable with the Praxis 48.
The mechanisms are as follows:

— The keyboard assembly.
— The bell crank assembly.
— The print activating bail.
— The segment.
— The carriage and platen.

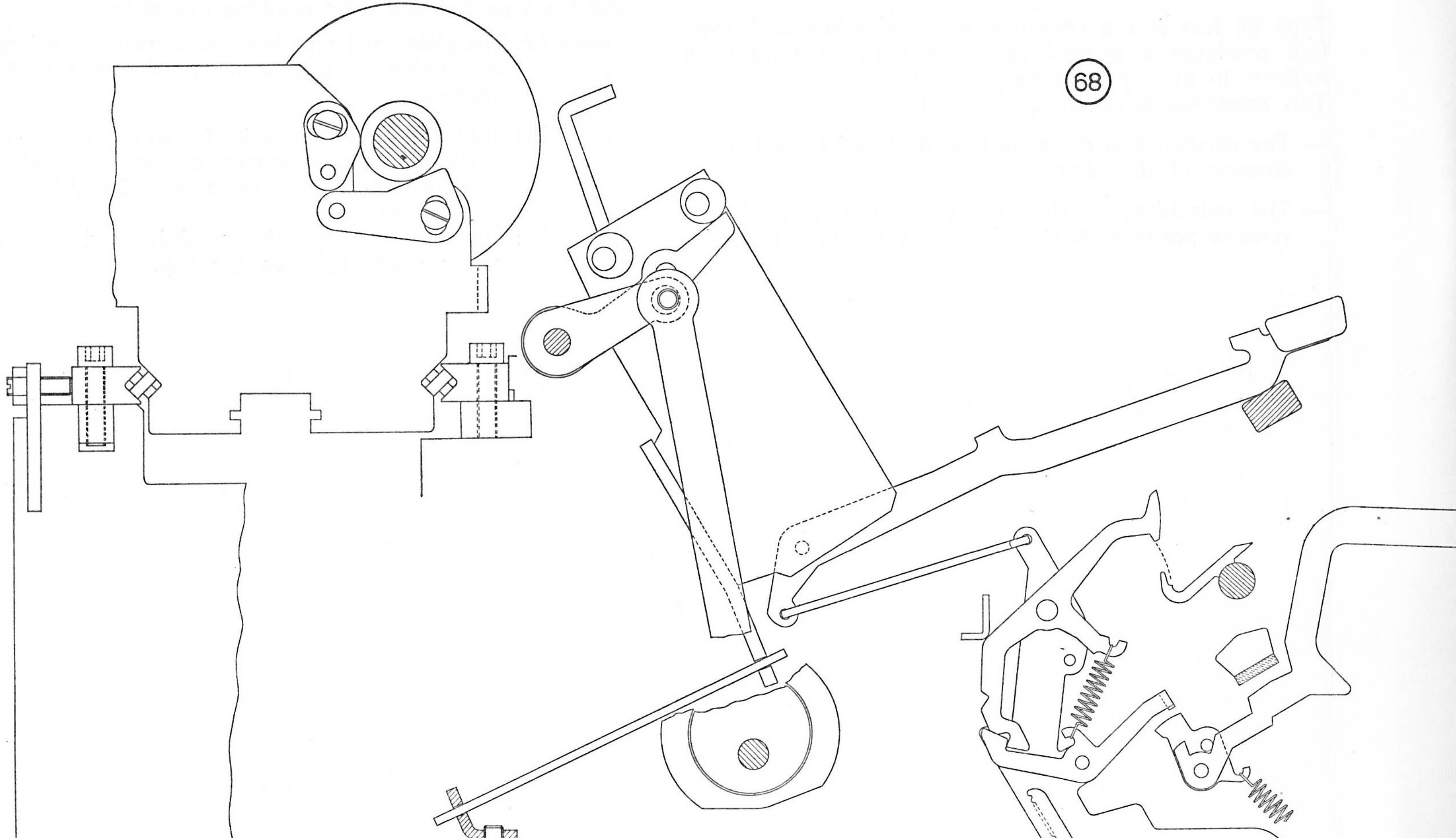
The mechanisms not illustrated in figure 68 are referred to as accessories. These would be:

— Ribbon lift and ribbon feed.
— Printing cam clutch.
— Impression control.
— Escapement.
— Shift.

Before analyzing the conditions necessary to obtain printing, the specific terminology used on this subject should be clearly defined. The terms related to the line of write are as follows:

— Type on feet.
— Ring and platen.
— Motion.

NOTE - In figure 68 and following figures, the arm and eccentrics, which control the height of the segment and its motion, are illustrated on the left of the segment, whereas in reality they are on the right.



68

TYPE ON FEET

Type on feet is the condition achieved when each type face produces a printed character with an impression uniform in density from top to bottom.
This condition is obtained through:

— The curvature of the type face, designed to match the contour of the platen.

— The coinciding of the two curvatures through the relative positions of the platen and the type face.

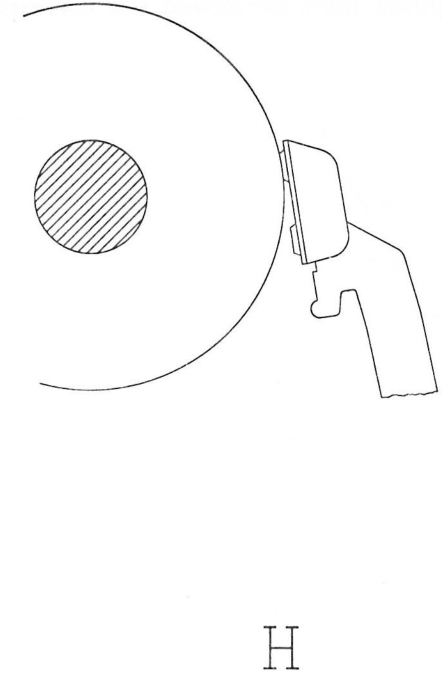
The illustrations show various relationships of the platen and the type face and their resulting impressions.

Figure 69: The platen and type face are correctly positioned in relation to each other producing a perfect impression.

Figure 70: Illustrates a relationship in which the upper portion of the character contacts the platen first, resulting in the character printing light on the bottom.

Figure 71: Illustrates the opposite condition and the character prints light on the top.

69



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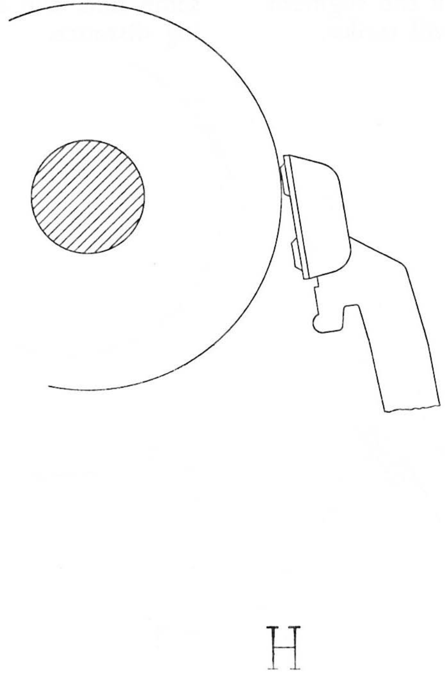
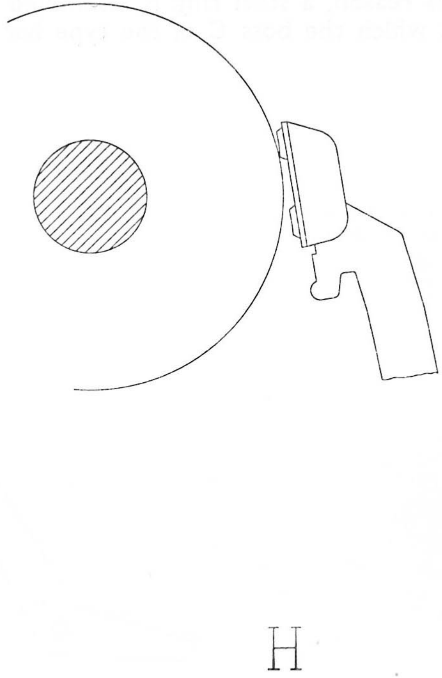


71



RING AND PLATEN

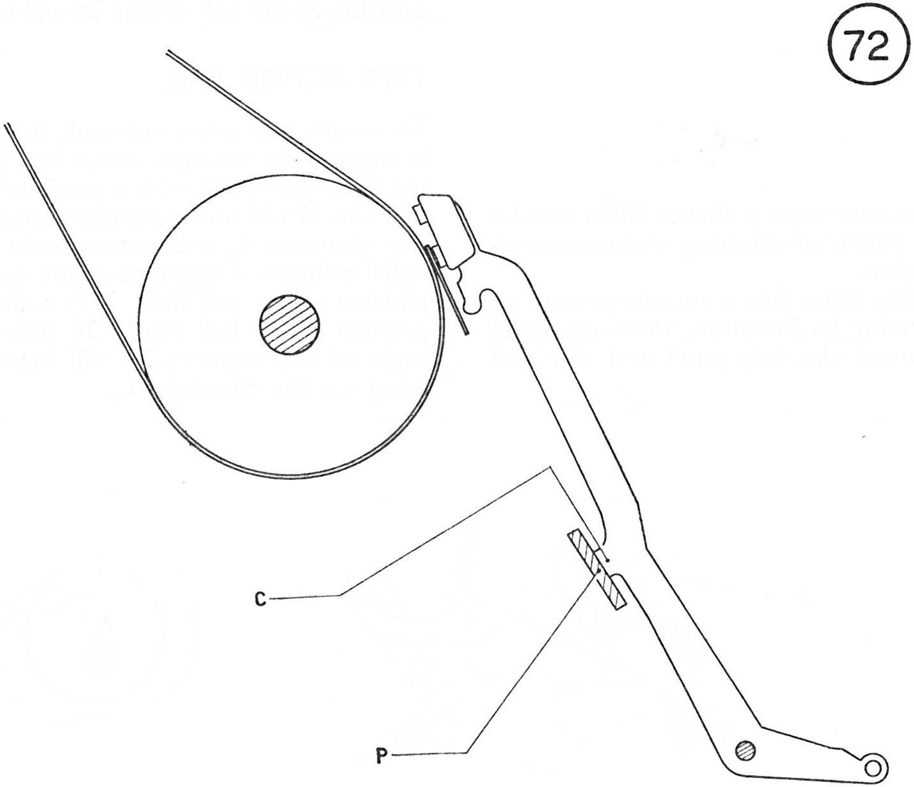
The term Ring and Platen expresses the relationship between the platen and the type face at the printing point. The force of the type bar at the moment of impact is in excess of the amount required for printing. It is therefore necessary to stop the type bar movement in such a manner as to permit printing without embossing or cutting the paper.
For this reason, a steel ring is assembled on the segment against which the boss **C** of the type bar will strike.

MOTION

Motion defines the vertical movement of the segment needed for the printing of the upper and lower case characters on the same line of write.

Each type slug has two protruding printing surfaces, the bases of which are 6,6 mm. (.259″) apart.

In order for these two printing surfaces to print on the same line, the segment must be moved the corresponding distance.


72
C
P

In order to better understand the adjustments pertaining to printing, an analysis of the theoretical relationship between the mechanisms involved is necessary. The areas to be analyzed are as follows:

— Keyboard.
— Type Action Bail.
— Type Bars.
— Segment.

KEYBOARD

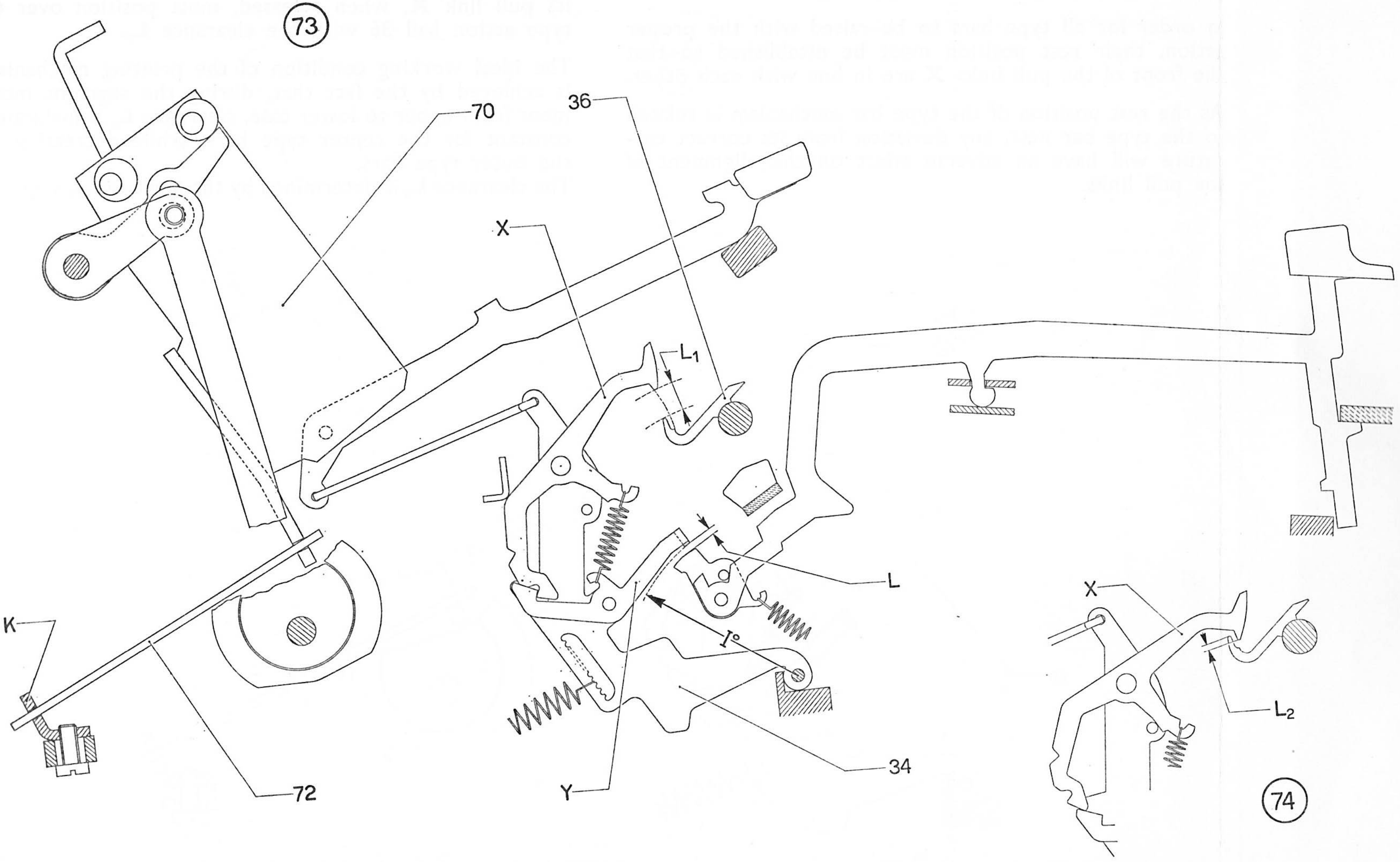
Although a key lever does not have a direct effect on the actual printing, it is the means of selecting and commanding the specific mechanism.

It is necessary that the key lever has a certain amount of free travel before performing its functions, this free travel is the clearance **L** between the trip pawl and the pull link latch **Y**.

The key levers are mounted in the keyboard housing, which is fastened to the side walls of the machine by four screws, and is not adjustable. Therefore, the clearance **L** will not alter unless the parts have been bent. The dotted line of the radius l shows that change in the angular position of the bell cranks **34** will not alter the clearance **L**.

TYPE ACTION BAIL

To ensure that when released, the hook of the pull link **X** is engaged by the type action bail **36**, it must position over the type action bail with a predetermined clearance L_1. The pull link **X** will then have the clearance L_2 shown in figure 74. The clearance L_1 and consequently L_2 is established by the radial position of the type action bail **36**. Although the rest position of the pull links **X** is a direct result of the angular position of the bell cranks **34**, altering of the height or the angle of the segment **70** will have relatively little, if any, effect on the clearance L_1.


73
70
36
X
L1
L
I°
K
72
Y
34
X
L2
74

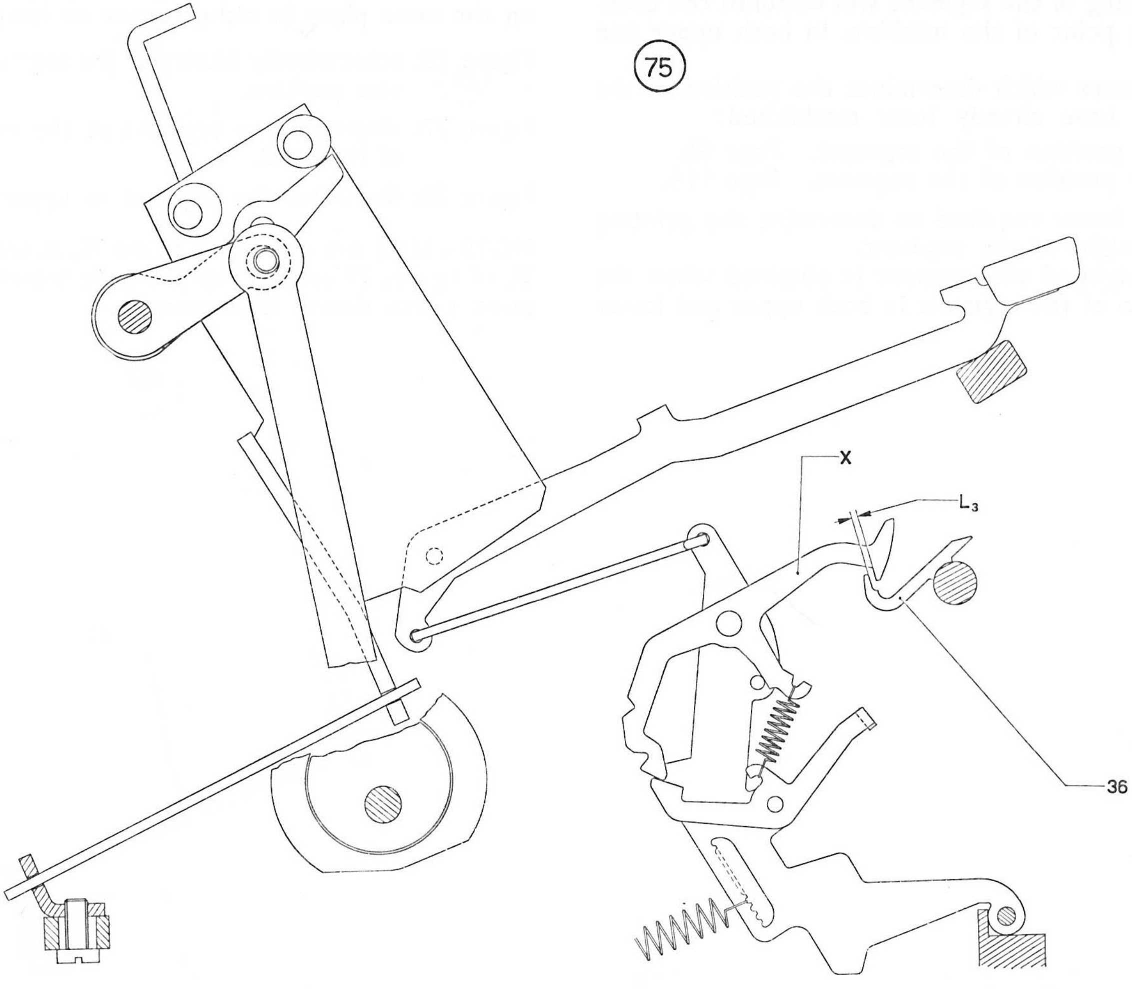
TYPE BARS

In order for all type bars to be raised with the proper action, their rest position must be established so that the front of the pull links **X** are in line with each other.

As the rest position of the type bar mechanism is related to the type bar nest, any deviation from its correct curvature will have an adverse effect on the alignment of the pull links.

To ensure positive activation of the type bar mechanism, its pull link **X**, when released, must position over the type action bail **36** with the clearance $\mathbf{L}_3$.

The ideal working condition of the printing mechanisms is achieved by the fact that, during the segment movement from upper to lower case, clearance $\mathbf{L}_3$ is maintained constant for the center type bars, while decreasing for the outer type bars.
The clearance $\mathbf{L}_3$ is determined by the angle of the segment.



75

SEGMENT

Proper positioning of the segment will establish the theoretical printing point of the machine, in both upper and lower case.
Two of the factors which determines the position of the printing point have already been established:

— The lateral position of the segment. Page 96.
— The angular position of the segment. Page 114.

The remaining factor required to determine the printing point is the height of the segment.
The correct height of the segment is obtained when the angular position of the segment in both upper and lower case is the same. The same angular position of the segment is re-established when the segment pivot points position on the same plane in either upper or lower case.

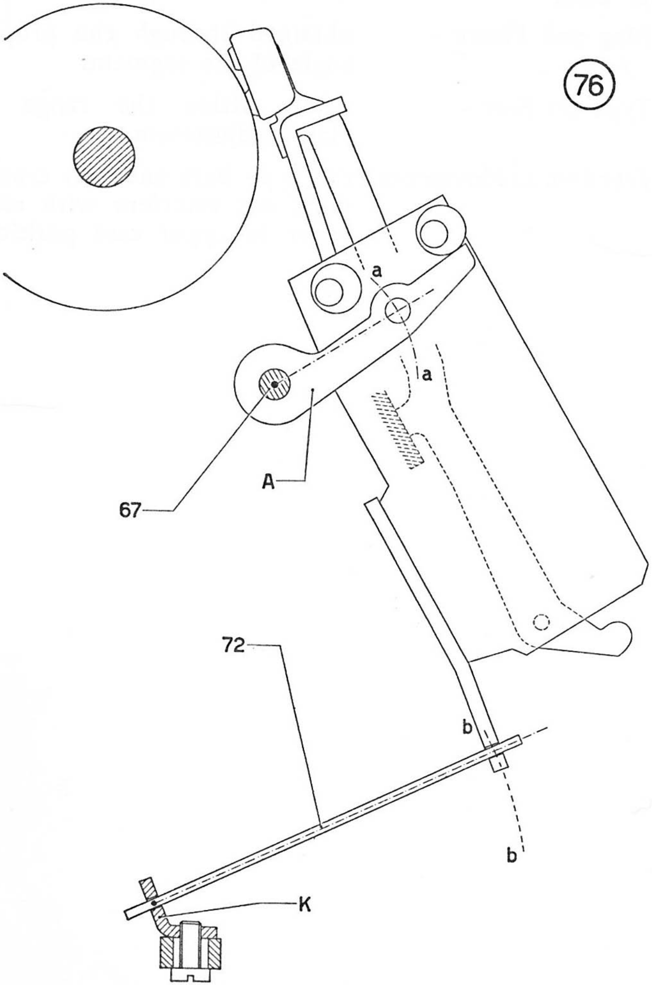
Figure 76: schematically illustrates the segment in the lower case position.

Figure 77: illustrates the segment at the mid-way position of its travel.

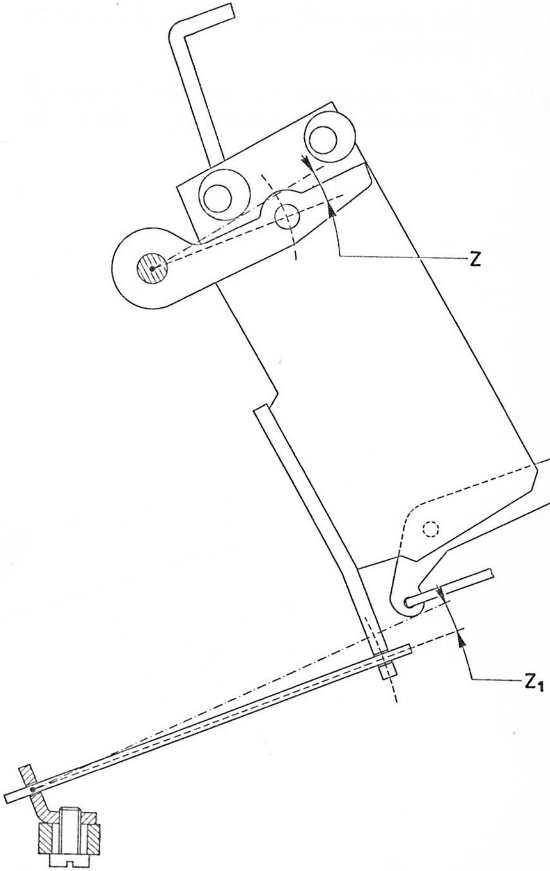
Figure 78: illustrates the segment in upper case.

NOTE - Lines **a-a** and **b-b** of figure 76, as well as arcs Z and Z_1 of figures 77 and 78, represent the travel of the segment pivot points during its movement.

(76)



(77)



In either the upper or lower case position, the angle of the segment will conform to the line **T-T**.
With any type bar raised so that its boss **C** is against the segment stop ring **P**, the characters on the type slug are on the line $\mathbf{T_1}$-$\mathbf{T_1}$.
Since the two lines **T-T** and $\mathbf{T_1}$-$\mathbf{T_1}$ are perfectly parallel, the condition of ring and platen will be the same in either upper or lower case position.

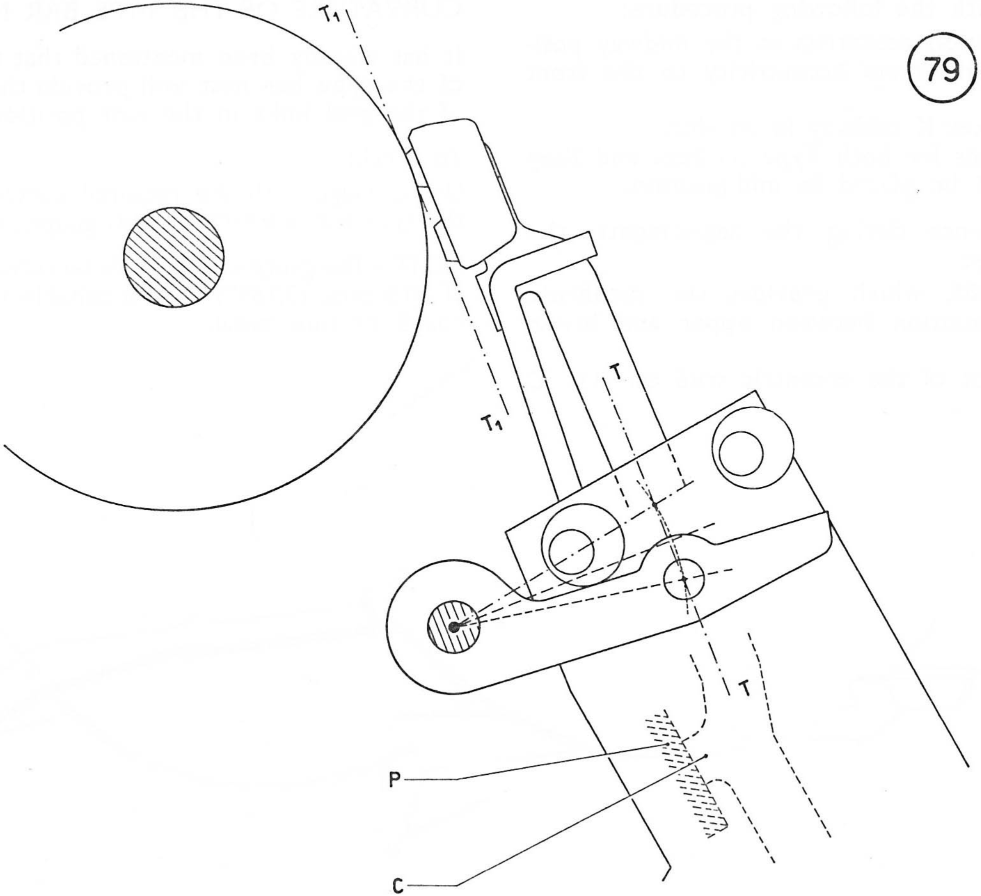
Note: The height of the segment is obtained through the eccentrics, and is considered satisfactory when the following conditions are obtainable in both upper and lower case:

— Ring and Platen - obtained through the proper angle of the segment.

— Type on Feet - when within the range of Platen adjustment.

— Freedom of Movement - the type bars and bell cranks must not interfere with each other in upper case position.

79



Before starting the adjustments, the segment and related parts should be positioned as close as possible to their final position.
This can be done with the following procedure:

- Place the two motion eccentrics at the midway position, with their maximum eccentricity to the front of the machine.
- Position the bracket **K** midway in its slot.
- The adjusting plates for both Type on Feet and Ring and Platen should be placed in mid-position.

To prevent interference during the adjustments, the following is necessary:

- Disconnect Link **81**, which provides the automatic impression compensation between upper and lower case (figure 57).
- Loosen the locknut of the eccentric stud on arm **C** (figure 48).

ADJUSTMENTS

1 - Figure 80

CURVATURE OF THE TYPE BAR NEST

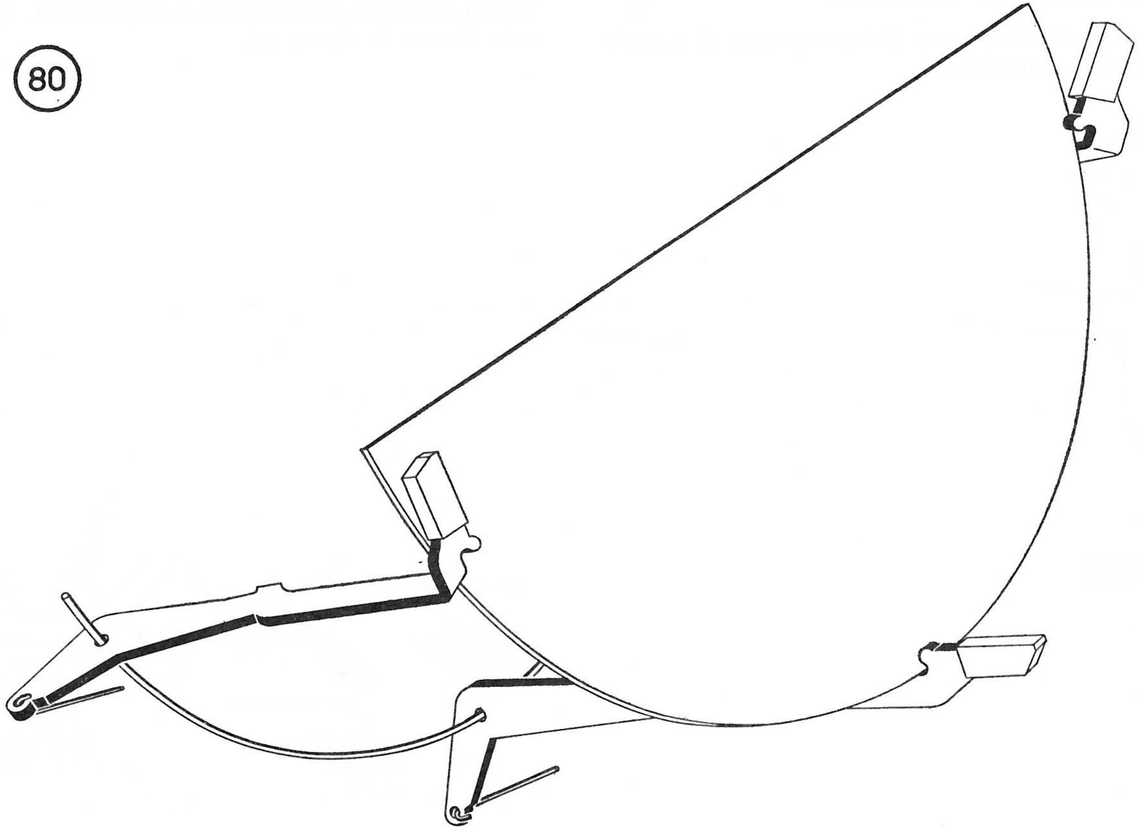
It has already been mentioned that the proper curvature of the type bar nest will provide the required alignment of the pull links in the rest position.

To check:

Use a gauge with the required curvature and ensure that the type bars conform to this gauge, as shown in figure 80.

NOTE - The gauge can be made by cutting a disc with a radius of 80.5 mm. (3.169″) from a suitable material such as cardboard, or thin metal.

80



2 - Figure 81

KEY LEVERS REST POSITION ADJUSTMENT

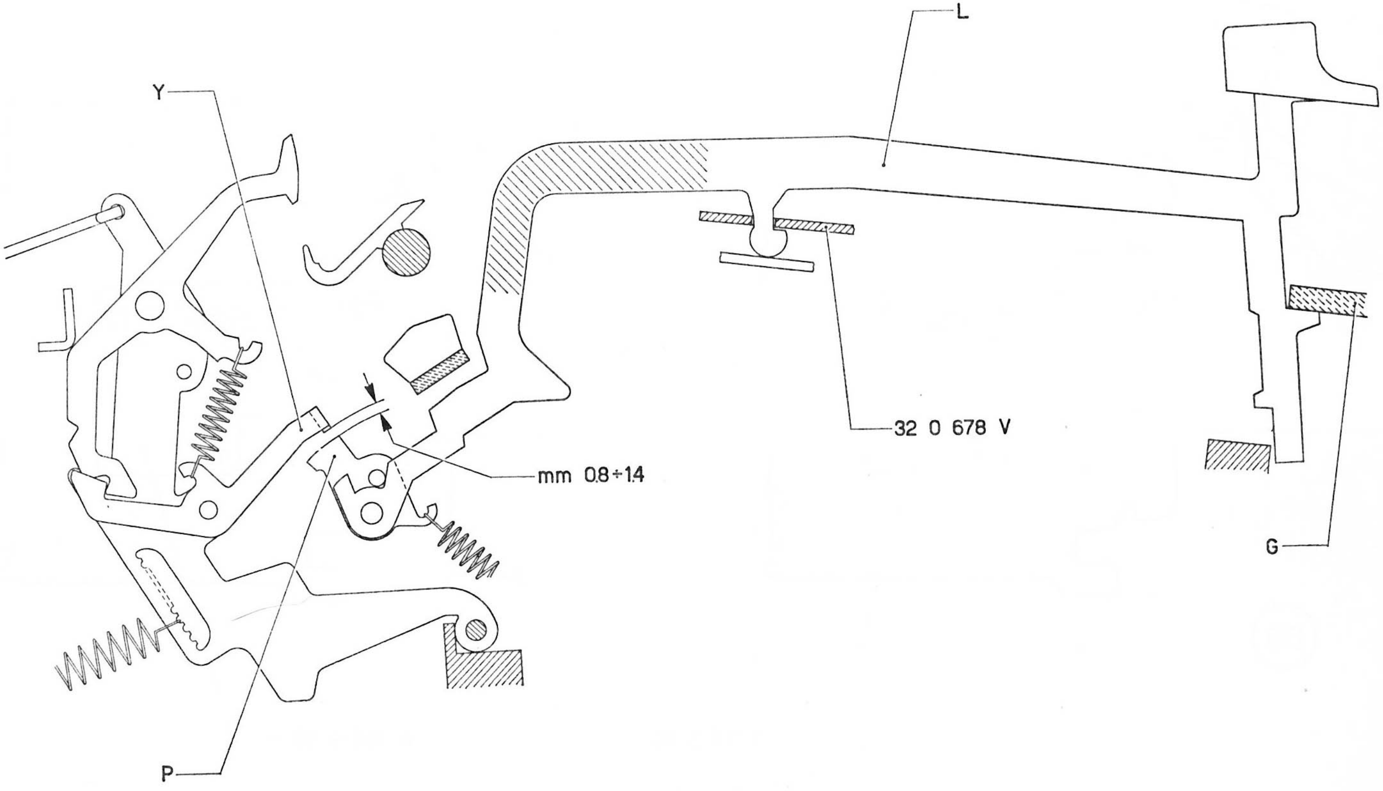
- The key levers must be retained in the keyboard housing and maintain freedom of movement.

To adjust: Reposition the Key Lever Retaining Plate 32 0 678 V to obtain the above conditions.

- In the rest position, with the key lever against the rubber bumper **G,** there should be a clearance of .8 to 1.4 mm. (.031″ to .055″) between the trip pawl **P** and pull link latch **Y.**

To adjust: Form the respective key lever **L** in the hatchured area shown in figure 81.

(81)



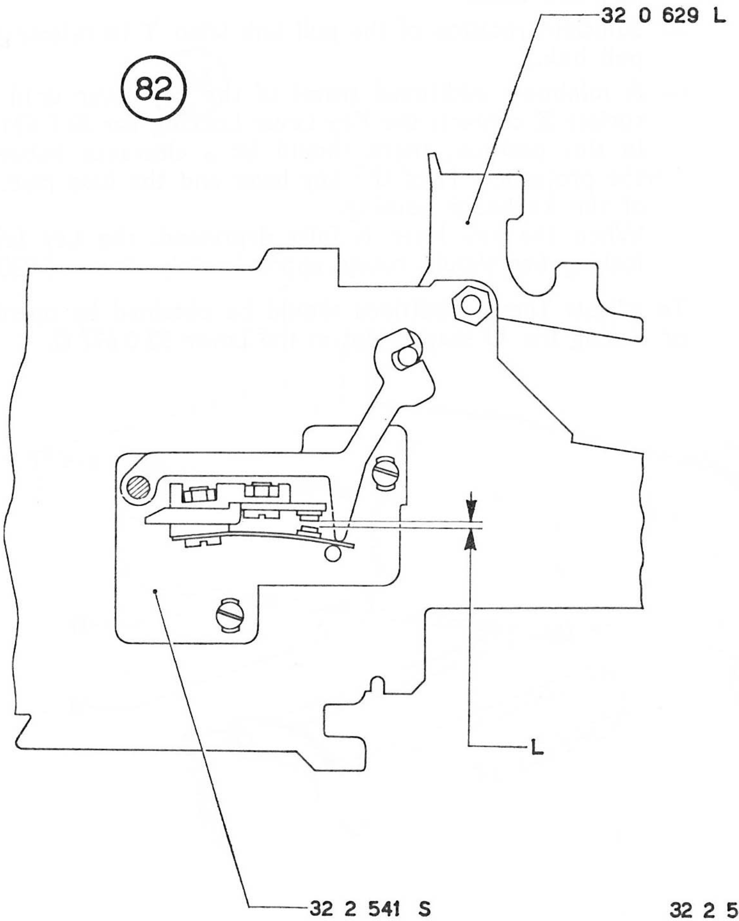
3 - Figures 82-83

MOTOR SWITCH ADJUSTMENT

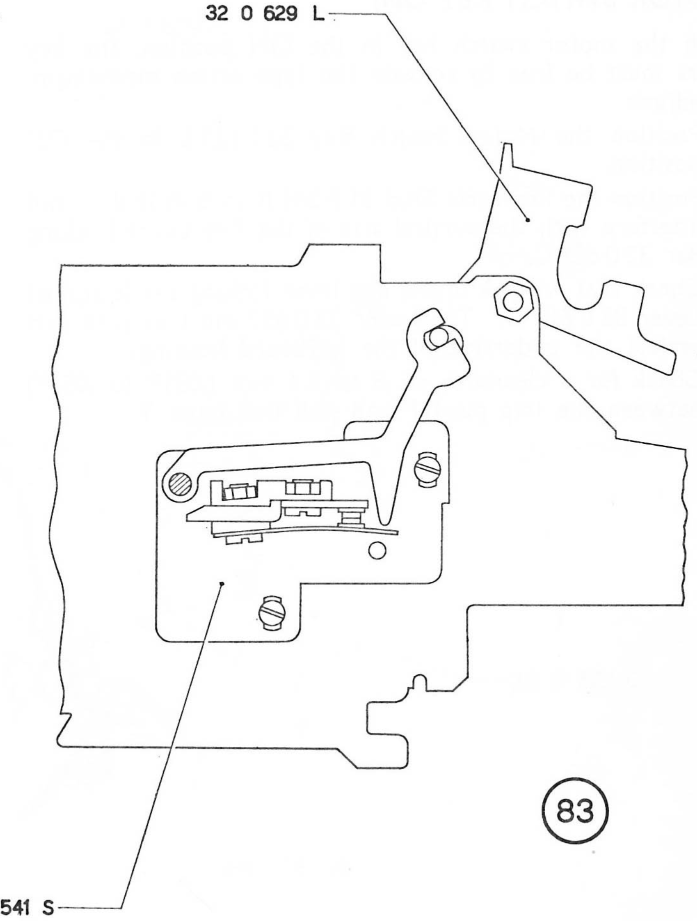
— With the Motor Switch Key 32 0 629 L OFF, there should be a clearance **L** between the contact points (figure 82).

— With the motor switch key ON, there must be a positive contact between the points (figure 83).

To adjust: Loosen the two screws securing the Assembly 32 2 541 S and position the assembly until there is approximately .8 mm (.031") clearance between the points with the switch in the OFF position. Tighten the two screws securing the assembly.



82



83

4 - Figure 84

KEY LEVER LOCKING BAR ADJUSTMENT (MOTOR SWITCH KEY ON)

With the motor switch key in the ON position, the key levers must be free to activate the type action mechanism: To adjust:

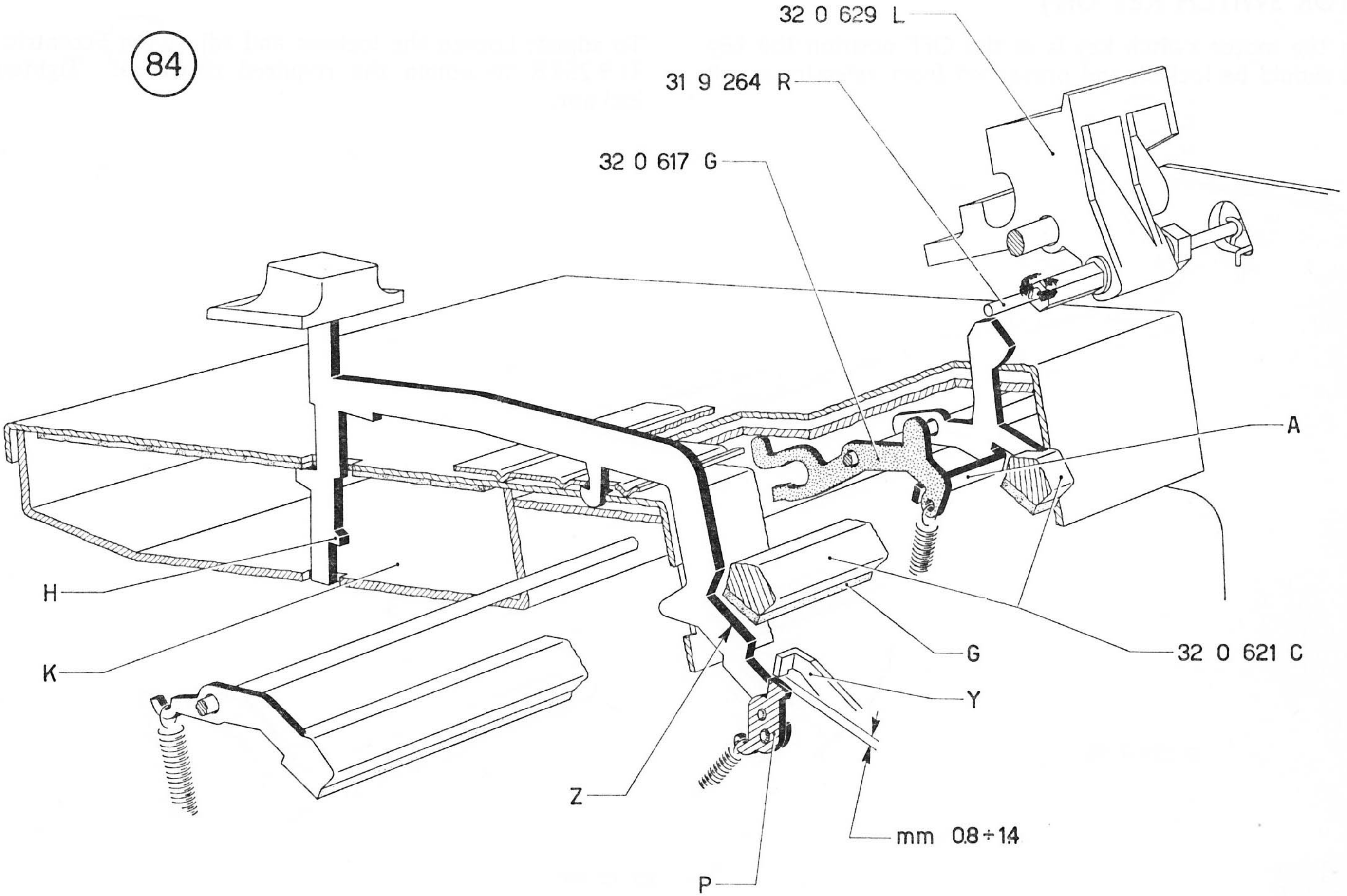
- Position the Motor Switch Key 32 0 629 L in the ON position.
- Position the Eccentric Stud 31 9 264 R so that it does not interfere with the vertical arm of the Key Lever Locking Bar 32 0 621 C.
- Check that wing **A** of the key lever locking bar is against Lever 32 0 617 G. The Lever 32 0 617 must in turn rest against the underside of the keyboard housing.
- Check for a clearance of .8 to 1.4 mm (.031″ to .055″) between the trip pawl **P** and pull link latch **Y**.

When a key lever is depressed there should be:

- Initial free movement until the trip pawl contacts the pull link latch.
- Sufficient rotation of the pull link latch **Y** to release the pull link.
- A minimum additional travel of the key lever until its surface **Z** contacts the Key Lever Locking Bar 32 0 621 C. In this position, there should be a clearance between the projection **H** of the key lever and the base plate **K** of the keyboard housing.
  When the key lever is fully depressed, the key lever locking bar should rotate approximately .5 mm (.020″).

To adjust: These conditions should be obtained by opening or closing the **U** shaped slot in the Lever 32 0 617 G.

(84)



5 - Figure 85

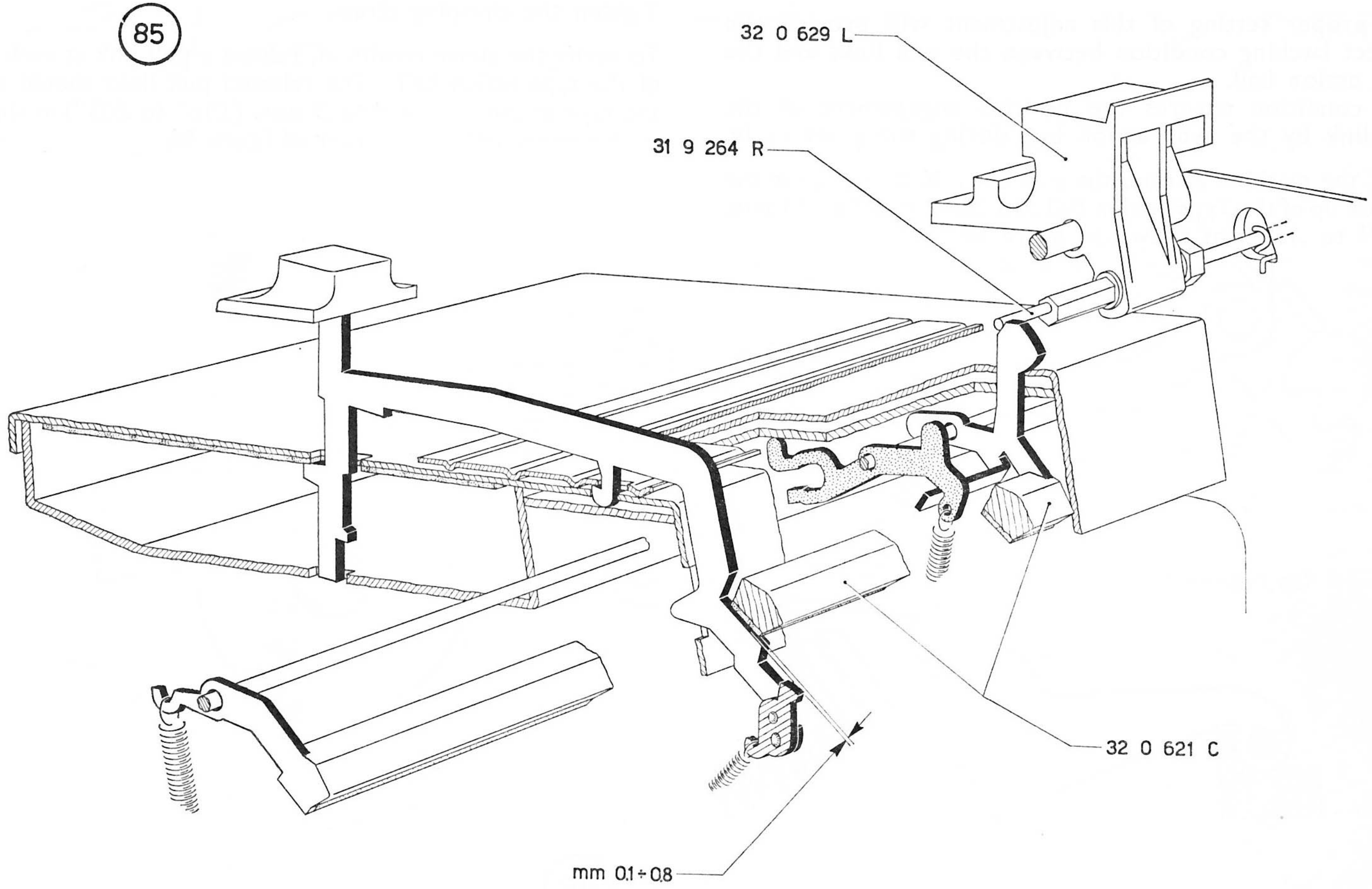
KEY LEVER LOCKING BAR ADJUSTMENT (MOTOR SWITCH KEY OFF)

When the motor switch key is in the OFF position the key levers should be locked, and prevented from releasing a pull link.

With the motor switch key OFF the Key Lever Locking Bar 32 0 621 C should clear the rear of the key levers by .1 to .8 mm. (.004″ to .031″).

To adjust: Loosen the locknut and adjust the Eccentric Stud 31 9 264 R to obtain the required clearance. Tighten the locknut.

(85)



6 - Figures 86-87

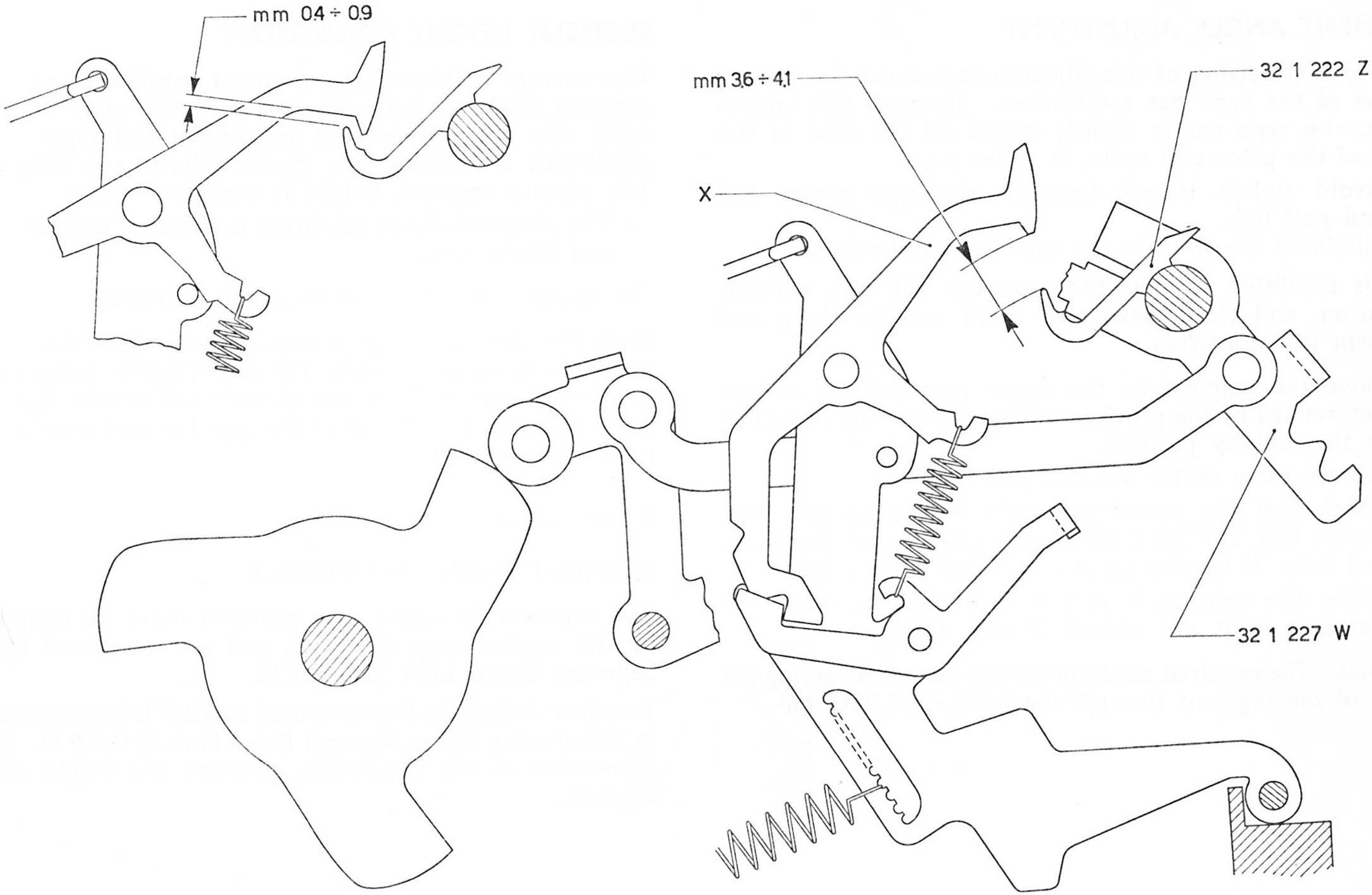
TYPE ACTION BAIL ADJUSTMENT

The proper setting of this adjustment will provide the correct latching condition between the pull links and the type action bail.
This condition ensures the positive engagement of the pull link by the type action bail during the print cycle.

With the machine at rest, the pull links **X** should clear the vertical lip of the Type Action Bail 32 1 222 Z by 3.6 to 4.1 mm. (.141″ to .161″) as shown in figure 86.

To adjust: Loosen the clamping screw of the Type Action Bail Arm 32 1 227 W. Rotate the type action bail until the required clearance is obtained.
Tighten the clamping screw.

To verify the above condition, release a pull link at each end of the type action bail. The released pull links should clear the type action bail by .4 to .9 mm. (.016″ to .035″) as shown in the upper left hand corner of figure 86.



86

7 - Figure 87

SEGMENT ANGLE ADJUSTMENT

The correct setting of this adjustment ensures the proper action of the type bar mechanism. Through this adjustment, the type bar is slightly raised off the nest at the start of the print cam cycle, in order to:

- **Avoid violent impact between the type action bail and pull link.**
- **Eliminate the slack in the type bar mechanism.**

If this condition is met, the type bar will rise without vibration, and the typewritten work will be sharp and uniform in impression.

- Move the segment to the upper case position already determined by the previous setting of Eccentric 31 9 214 F at the midway position.
- Release some center and end pull links **X**.
- Check that the center pull links **X** overlap the Type Action Bail 32 1 222 Z by .6 mm. (.024"), and the outer pull links **X** overlap by .4 mm. (.016") figure 87.
- When the segment is in the lower case position, this clearance must not exceed .9 mm. (.035").

To adjust: The required conditions are obtained by varying the angle of the segment through the bracket 32 0 908 M.

8 - Figure 87

SEGMENT HEIGHT ADJUSTMENT

The correct height of the segment establishes the same segment angle in both upper and lower case. This ensures that the proper ring and platen and type on feet conditions are within the platen adjustment range.
The precise segment height is obtained when:

- **The ring and platen condition is identical in both upper and lower case.**

To adjust: Reposition the Eccentric 31 9 214 F.

With the segment in upper case position there should be a clearance **L** [approximately 1.0 mm. (.039")] between the center type bars and the top of their bell cranks, figure 87. If this clearance is not correct the type bar nest is incorrectly positioned.

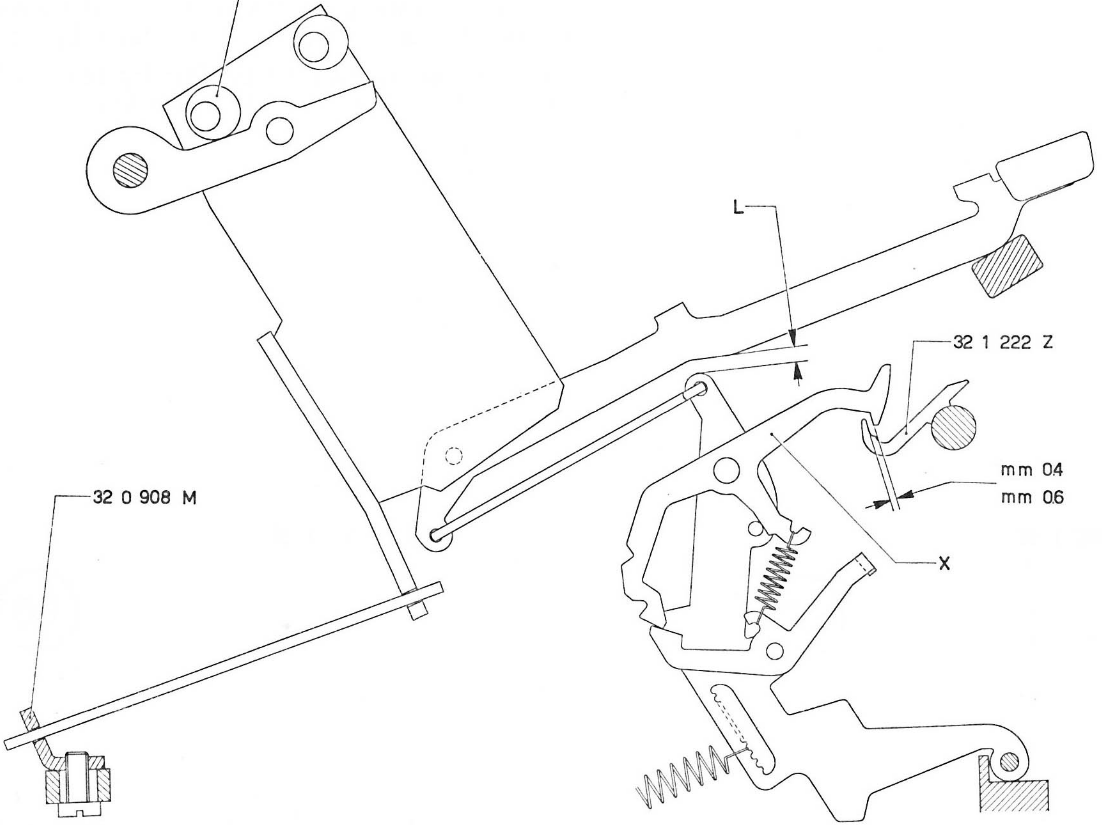
9 - Figure 88

SEGMENT DRIVE ADJUSTMENT

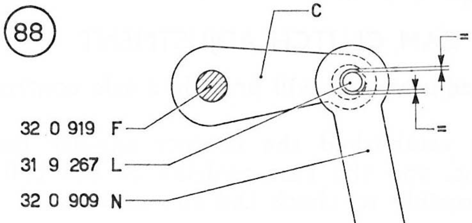
The segment in upper case position must be controlled by the motion stop eccentric, and not restricted by the Segment Drive Link 32 0 909 N.

To adjust: Adjust the Eccentric Stud 31 9 267 L until centralized in the opening of the Segment Drive Link 32 0 909 N. If this adjustment is not obtainable, re-check the height of the segment.

87


31 9 214 F
L
32 1 222 Z
mm 0.4
mm 0.6
X
32 0 908 M

88


C
=
=
32 0 919 F
31 9 267 L
32 0 909 N

10 - Figures 89-90

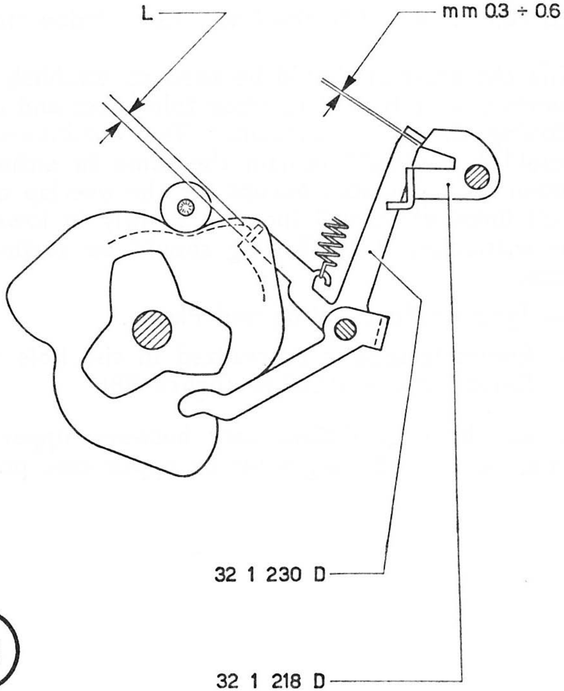
PRINT CAM CLUTCH ADJUSTMENT

These adjustments will provide a safe control of the print cam.
Having established the correct angular position of the segment, and the rest position of the bell cranks, it is now possible to check the adjustments of the print cam clutch.

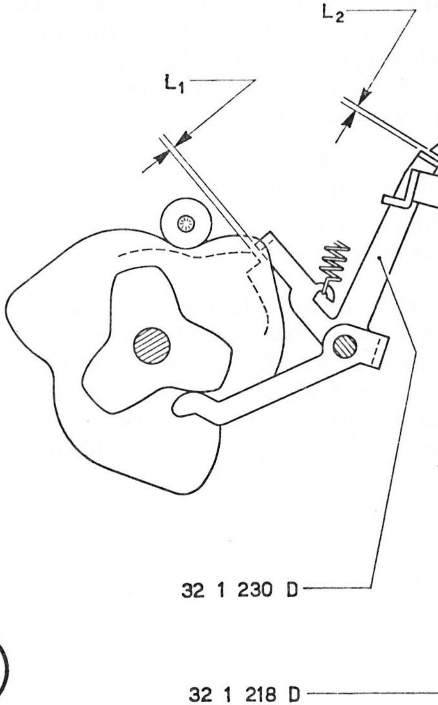
— With the machine at rest and all pull links latched, the Starting Lever 32 1 230 D should have a safe hold **L** on the spur of flange **D**. In this position the lip of the Print Cam Activating Bail 32 1 218 D should be held by the full thickness plus .3 to .6 mm. (.012″ to .024″) of the Starting Lever 32 1 230 D, (figure 89).

— With a pull link released, the Starting Lever 32 1 230 D must rotate into the recess of the Activating Bail 32 1 218 D with the clearance L_2 at the same time the lower wing must release the flange **D** with a clearance L_1 (figure 90).

To adjust: If necessary, form the Starting Lever 32 1 230 D as required to obtain the above conditions.



(89)



(90)

11 - Figure 91

TYPE ON FEET - RING AND PLATEN ADJUSTMENTS

Once the upper case position of the segment is established, it is possible to obtain the Type on Feet and Ring and Platen by adjusting the height and depth of the Platen. These adjustments must be checked at both ends of the platen, and are to be obtained for the majority of type bars. Individual type bars that do not meet the conditions, must be individually adjusted in the normal manner associated with type alignment.

To adjust Type on Feet: Raise or lower the Plates 32 2 316 Y left and right as required.

To adjust Ring and Platen: Position the Plates 32 2 305 E left and right as required.

Note: With the segment in upper case, raise a type bar by hand and hold it against the segment stop ring with your finger, as indicated by the arrow in figure 91. In this position there must be a slight drag on a single sheet of .08 mm (.003″) paper. A gauge of three sheets of .08 mm (.003″) paper must be positively held under the same conditions.

12 - Figure 91

MOTION

The height of the segment has been adjusted to the upper case position. The lower case position must now be established so that both case characters print on the same line.

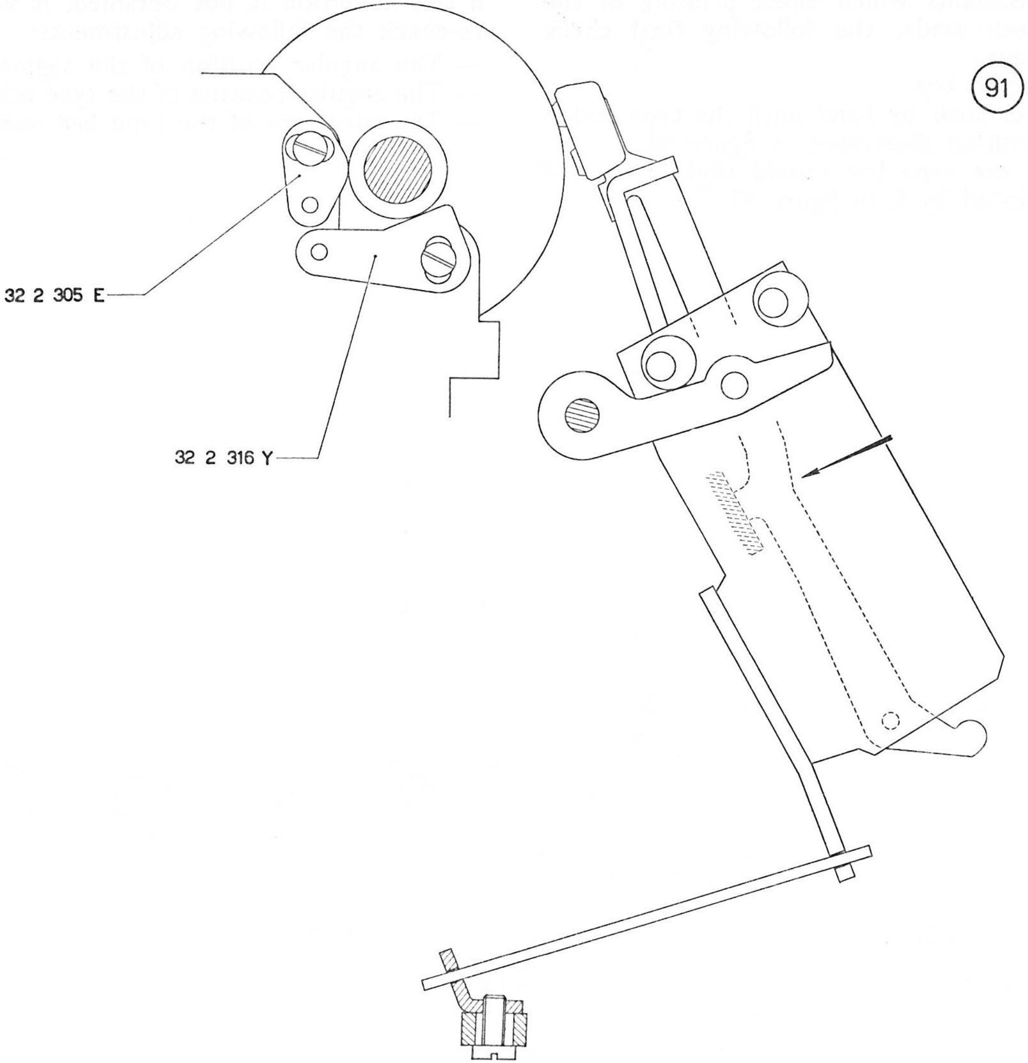
To adjust: Regulate the lower case motion stop eccentric.

The character H should be used to establish the correct motion, as it is held to close tolerances and critical positioning during production. The conditions previously established should remain the same in either upper or lower case position, except for the overlap of the outer pull links which will increase slightly in lower case.
In particular, the following should be verified in lower case.

- Type on Feet - Ring and Platen.
- Eccentric stud is centralized in the hole of the Shift Drive Link 32 0 909 N (figure 88).

If the above conditions vary between upper and lower case, recheck the segments in upper case position.

91



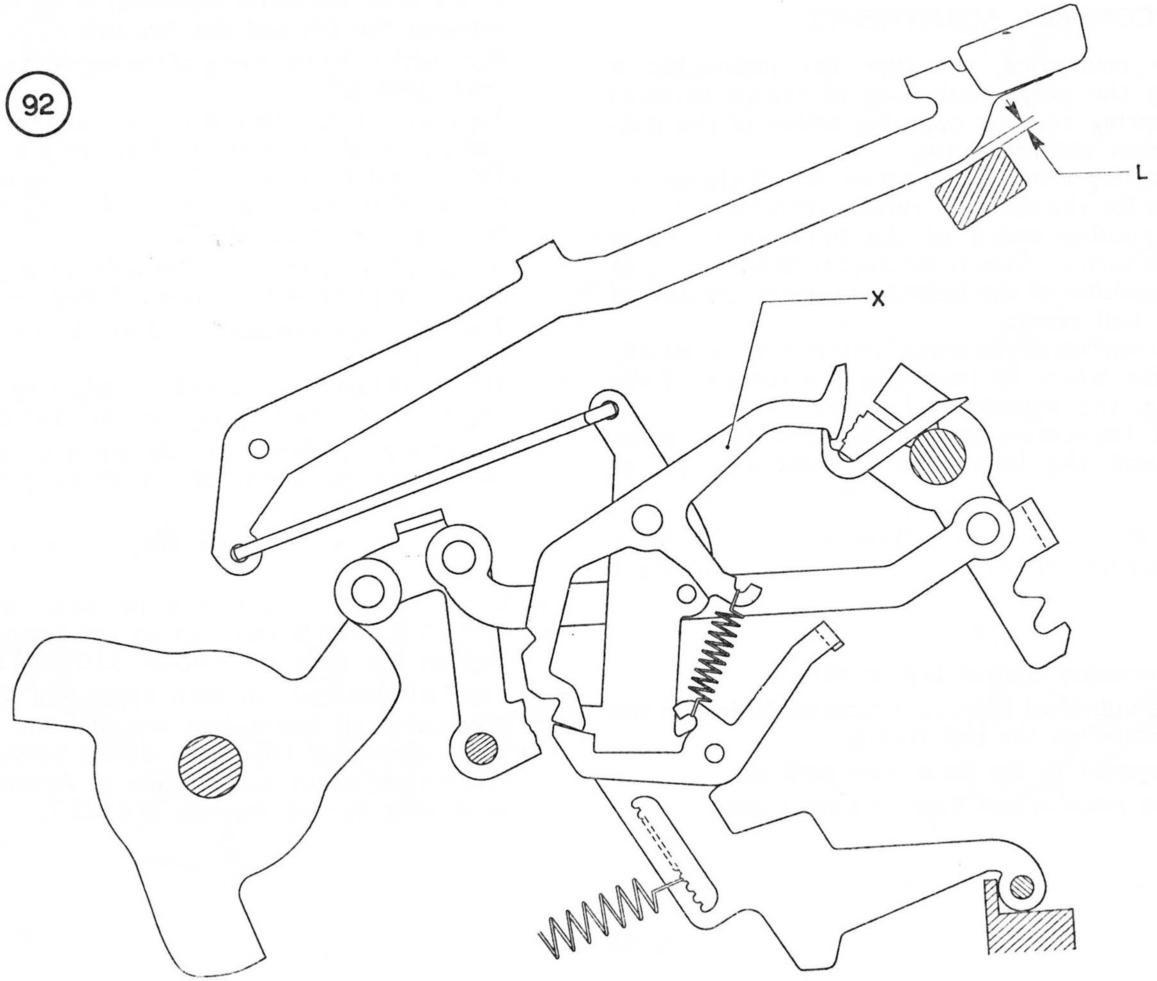
When all the adjustments which effect printing of the characters have been made, the following final check should be carried out.

- — Depress a character key.
- — Rotate the power shaft by hand until the type action bail is in the position illustrated in figure 92.
- — In this position the type bar should slightly rise off the nest as indicated by **L** in figure 92.

If this condition is not obtained, it will be necessary to re-check the following adjustments:

- — The angular position of the segment (figure 87).
- — The angular position of the type action bail (figure 86).
- — The curvature of the type bar nest (figure 80).

92



1 - Figure 93

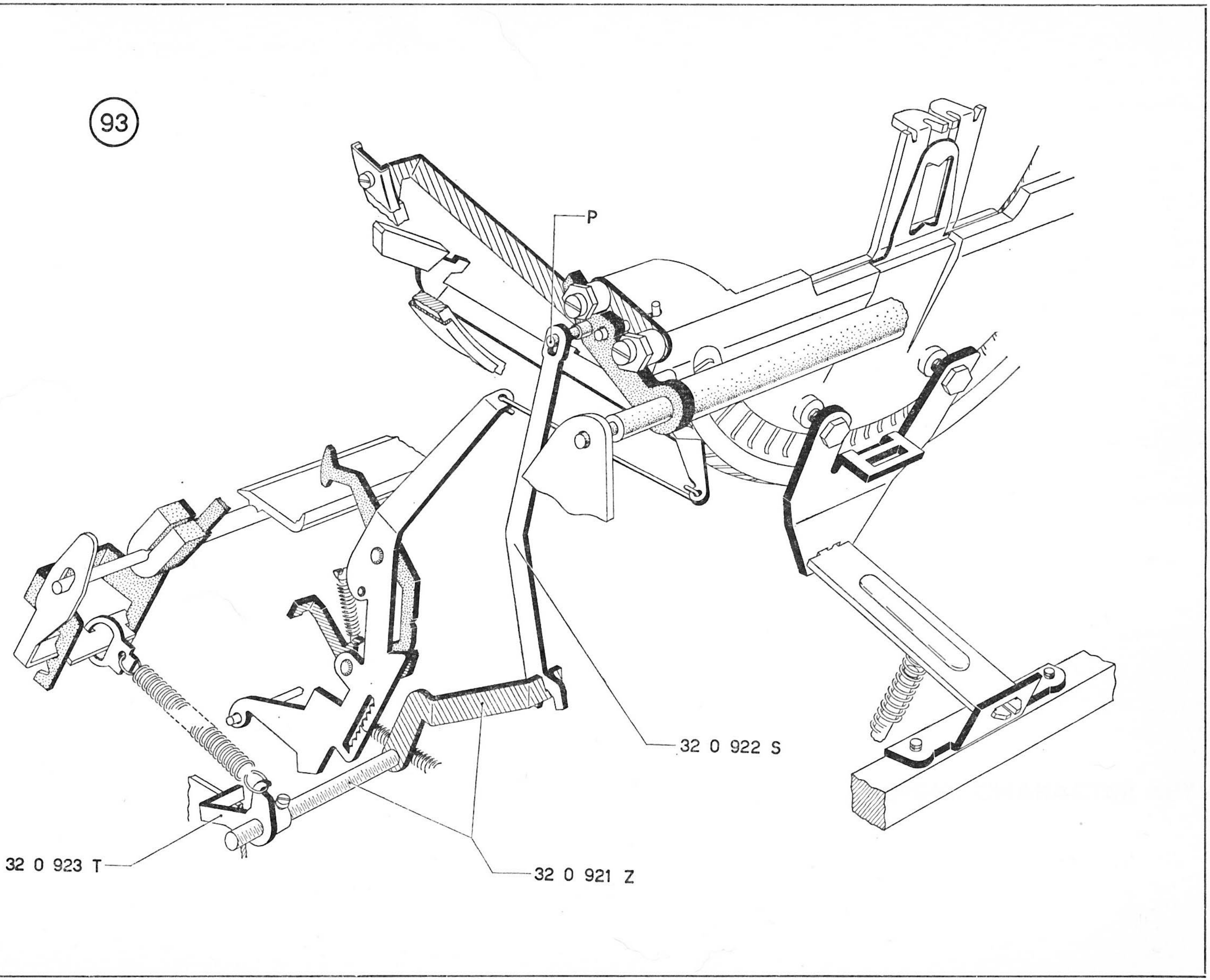
IMPRESSION CONTROL ADJUSTMENTS

As previously mantioned, the type bar impression is determined by the proper balancing of energy between the printing spring and the opposing action of the individual impression control spring.
The printing spring tension is constant for all characters. To compensate for the different surface areas of each character, the opposing action of the impression control spring must be varied. This is accomplished by raising or lowering the position of the individual impression control spring on the bell cranks.
The increase in surface of the capital letters is automatically compensated for when, by increasing the tension of the printing spring, the segment is lowered.
The individual impression control adjustments must be carried out with the Impression Control Key set at MINIMUM.

Before starting these adjustments, disconnect Link 32 0 922 S which gives the automatic impression compensation in upper case.

To adjust:

- Set the impression control key at MIN.
- Place all the individual Impression Control Springs in the midway position on the bell cranks.
- Shift the segment to the lower case position.
- Insert in the machine one sheet of bond paper.
- Place the Central Printing Lever Spring (corresponding to the H on the Italian keyboard) in the midway position between the 5th and the 7th slot.
- Place within the steel ring of the segment a gauge .35 mm. thick (.014").
  Type some h (small) and check that the printing is not too visible; the type should leave only a shade.
  This conditions is obtained by increasing or reducing the tension of the Printing Spring by forming the wing of the Printing Anchor 32 0 923 T.
- Insert in the machine one sheet of bond paper, two sheets of copy paper and two sheets of medium carbon paper.
- Type all small characters and check the impression on the second copy.
  This conditions is obtained by adjusting the Individual Impression Control Spring on the Bell Crank.
- Re-connect the Automatic Compensation Link 32 0 922 S and loosen the screw of the Printing Spring Anchor 32 0 923 T.
- Push the Link 32 0 922 S down until it limits against stud **P**.
- With the link held in this position, rotate Assembly 32 0 921 Z until it rests against the bottom of the link. Tighten the screw of Anchor 32 0 923 T.
- Type all characters in both upper and lower case and check that all impressions are uniform.
  If the density of impression differs between upper and lower case, adjust the position of Assembly 32 0 921 Z in respect to the Anchor 32 0 923 T.


93
P
32 0 922 S
32 0 923 T
32 0 921 Z

REPEAT CHARACTER KEYS

FOREWORD

In the course of normal typing there is frequently a need to repeat certain characters a number of times.
For example:

- Underscore, used to underline a word, phrase, or sentence.
- Period, used for dotted lines, diagrams, etc.

The repeat keys provide the repetition of the chosen characters or symbols.
In order for the character to repeat, its command mechanism must:

- Select and maintain selected the type bar mechanism.
- Engage the printing cam clutch and maintain it engaged.

To repeat the impression of the character, the printing cam must activate the following mechanisms in the same manner as previously described in the section on printing:

- Type bar.
- Ribbon lift and feed.
- Escapement.

COMMAND MECHANISM

When a repeat key is held depressed the following actions must result:

- The pull link **X** must unlatch, and be maintained unlatched.
- The print cam clutch must engage and be maintained engaged.

ASSEMBLY (REST POSITION)

The action of repeat is obtained by the same mechanisms which provides regular typing. The different action of these mechanisms is made possible by:

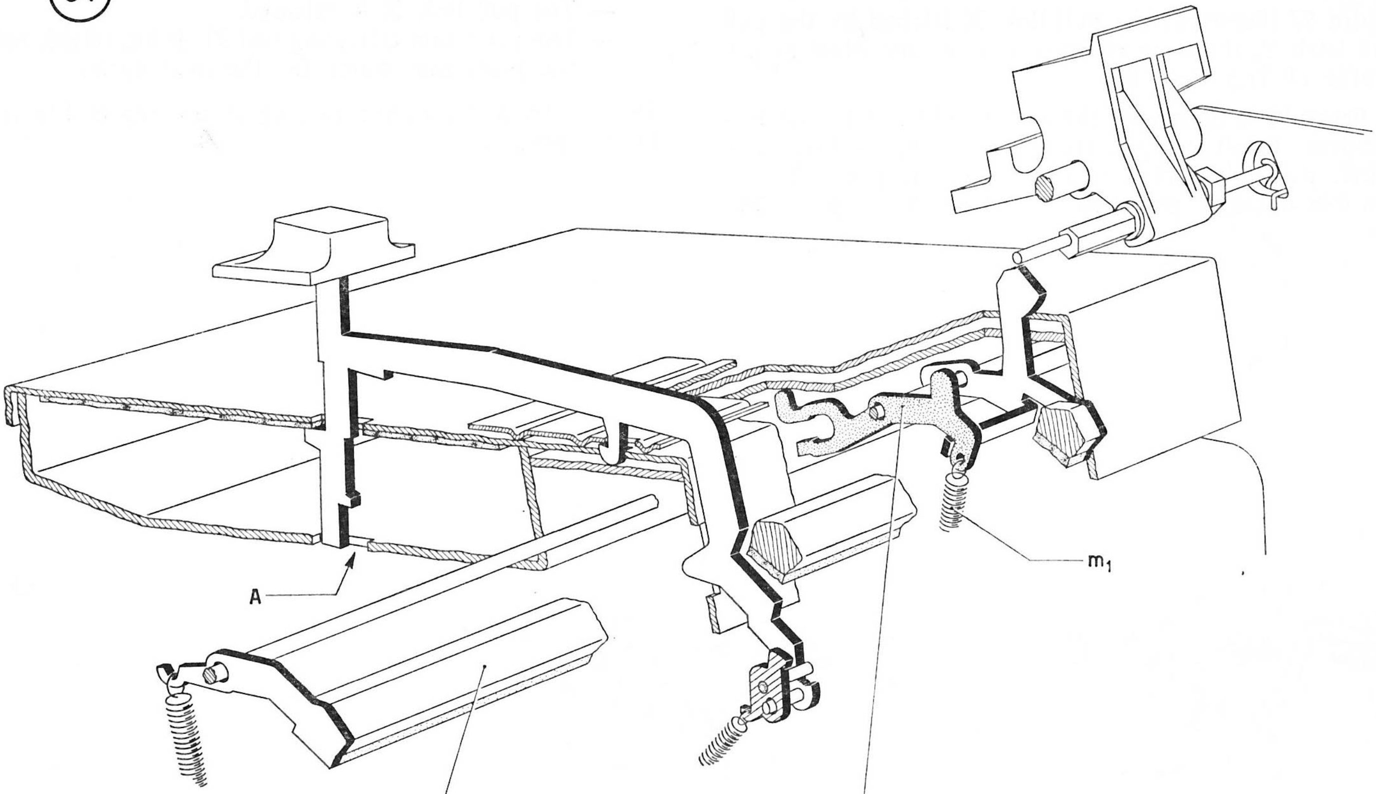
- The elongated lower guide slot **A**.
- The possibility of full depression of the key levers which in repeat overcomes the action of spring **m** of lever **19**.

ACTIVATION

Full depression of the repeat key through the key lever, trip pawl, and the pull link latch releases the pull link **X** which rotates until stopped by pin **P** (figure 95).
As a result:

- The pull link **X** will be in the path of the Type Action Bail **36**.
- The Print Cam Activating Bail **31** will have been rotated by the pull link **X**, releasing the clutch, to engage the print cam.

94



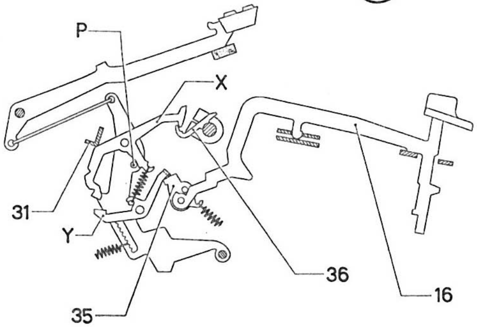
ACTIVATION OF REPEAT ACTION

- Figure 96 illustrates the raising of the type bar. During this movement, the pull link **X** is relatched in the same manner as during a single action print cycle.
- Figure 97 illustrates the pull link **X** latched by the pull link latch **Y**, the wing of which is now controlled by the profile of Trip Pawl **35**.
- In figure 98 is illustrated the restore of the type bar mechanism. In returning to its rest position, the bell crank causes pull link latch **Y** to rotate the trip pawl. This is possible because spring **m** is stronger than spring m_1.

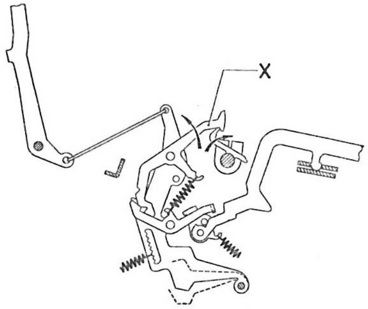
  The rotation of the trip pawl will pivot pull link latch **Y**, releasing pull link **X**.
- Figure 99 illustrates the type bar mechanism at the completion of one repeat cycle:
  - The pull link **X** is released.
  - The print cam activating bail **31**, being raised, releases the print cam clutch for the next cycle.

This action will continue as long as the repeat key is held fully depressed.

(95)



(96)



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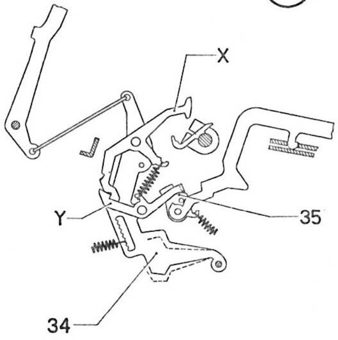
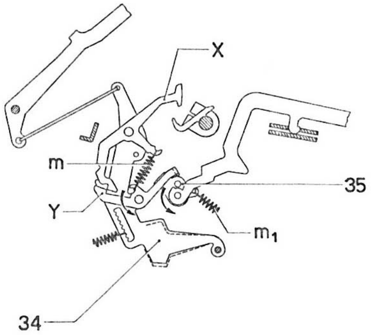
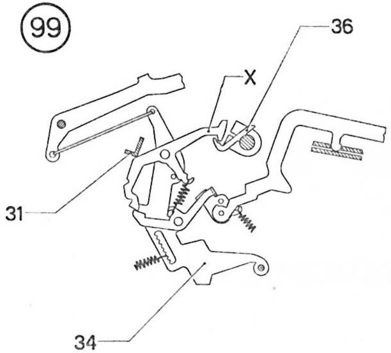


(98)



(99)



TYPING MEMORY

FOREWORD

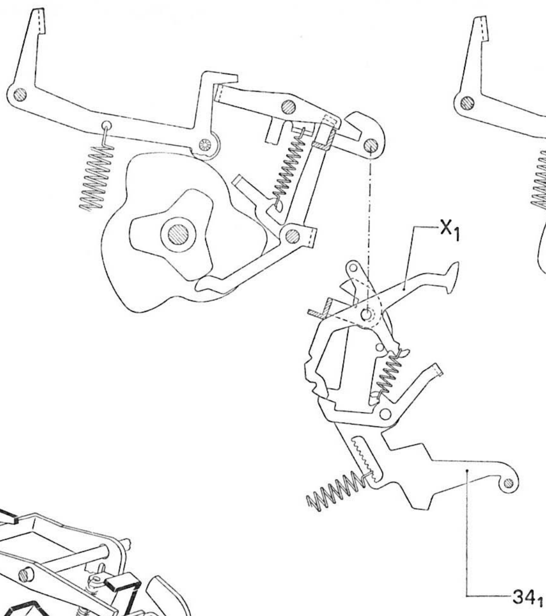
There are many common words in which two consecutive characters can be typed extremely fast by most typists, such as TH in the word THE. On conventional typewriters this condition may result in problems of crowding or type bars jamming.
To eliminate these problems, the Praxis 48 incorporates a unique memory feature which ensures that the characters print in correct timing sequence.

ACTIVATION

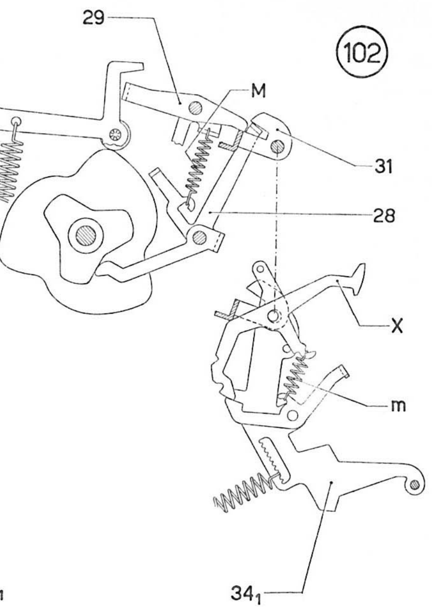
- Figure 100 illustrates the relationship between the type action bail and two pull links released in rapid succession.

The first Pull Link **X** is already being pulled by the Type Action Bail **36.** The second Pull Link **X_1**, being released too late to be engaged by the type action bail holds the Print Cam Activating Bail **31** raised.

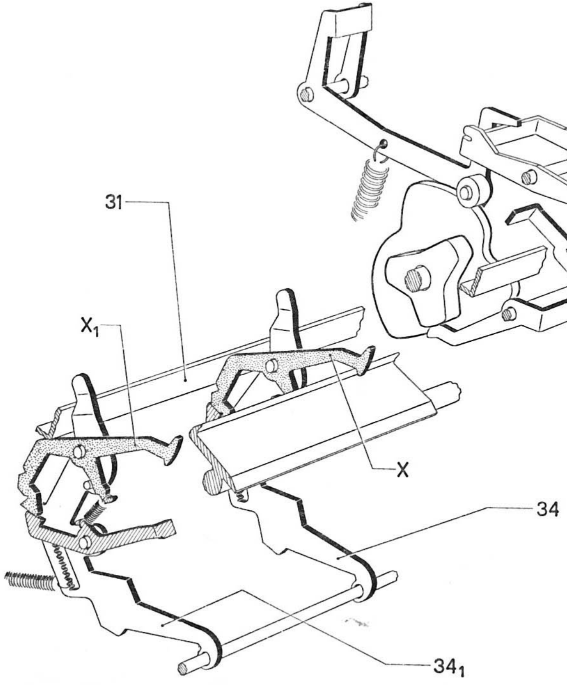
- Figure 101 illustrates in schematic form, the mechanism which controls the disengagement of the print cam clutch.
- In figure 102 the first print cycle is nearly completed and the following conditions are illustrated:
  - Print cam activating bail **31** has not been restored as the action of spring **m** prevents the action of spring **M.**
  - Starting Lever **28** does not disengage the print cam clutch, which continues cycling, activating the printing of the memorized character.



(101)



(102)



(100)

DEAD KEYS

FOREWORD

The dead key feature is an optional attachment which allows specific characters to print without allowing the carriage to space. This would be the case in a language which requires the use of accents, such as in the word cafe. Dead Keys operate in the same manner as a regular key, except that the dead key does not release the escapement dog from the escapement rack.

COMMAND MECHANISM

The command mechanism of a dead key must have the following actions:

- Select the required type bar mechanism.
- Activate the print cam clutch.

ASSEMBLY (REST POSITION)

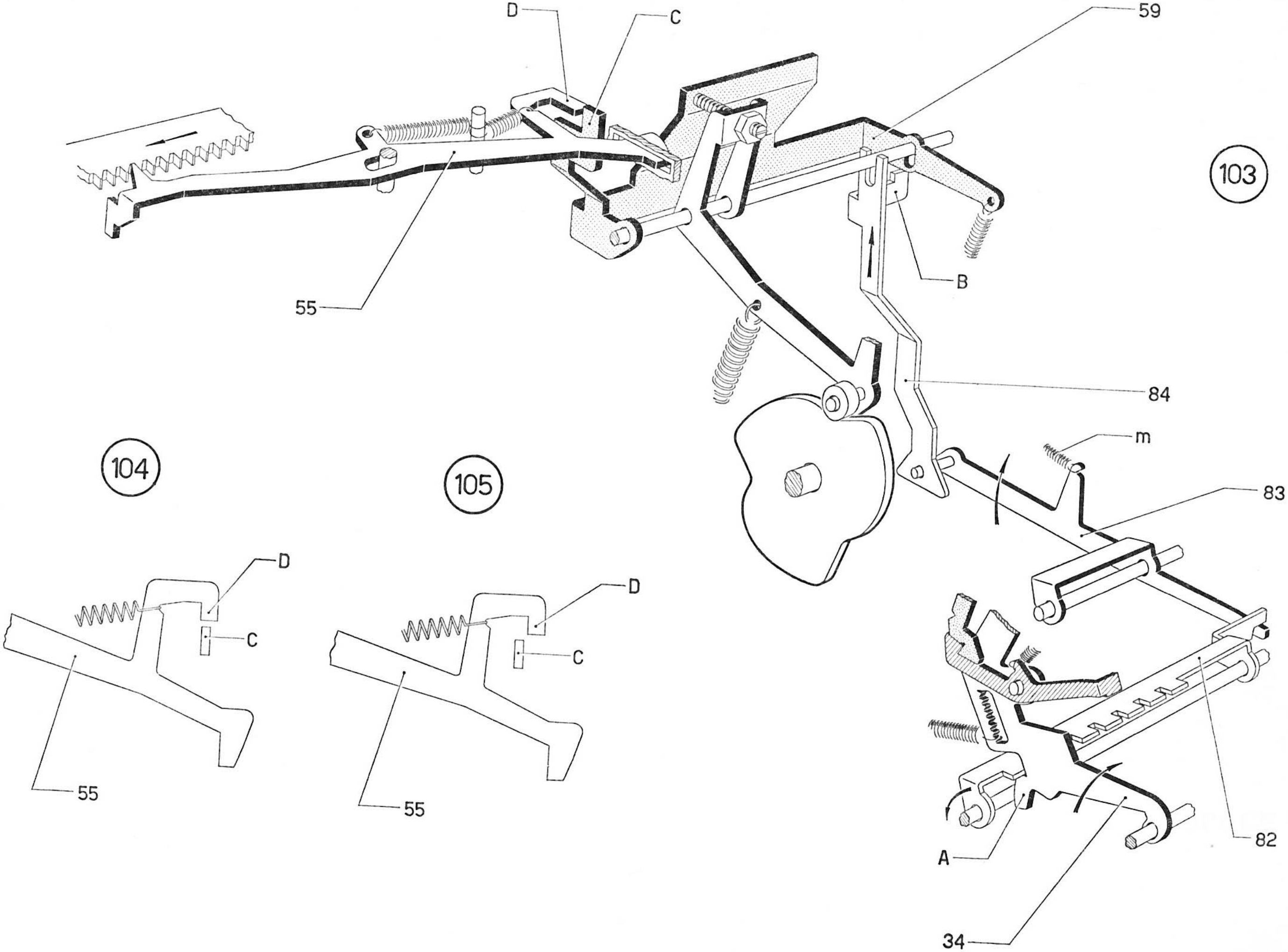
The Bell Crank **34** of a dead key has a lug **A** facing the comb **82**, which is maintained in contact with lug, by the action of spring **m**. Plunger Arm **84**, through lever **83** and comb **82**, rests under the escapement plate arm.

ACTIVATION

The activation mechanism of a dead key has the function of tilting the escapement plate **59**. This prevents the action of finger **C** on extension **D** of the escapement dog **55**. A print cycle of a dead key will cause:

- Lug **A** to rotate comb **82**, which through lever **83**, raises plunger arm **84**.
- Lip **B** to tilt the escapement plate **59** causing finger **C** to move as illustrated in figure 104-105.

During the cycle, the movement of finger **C** does not remove the escapement dog **55** from the escapement rack **54**.



103

104

105

SPACE BAR

FOREWORD

In normal typing it is necessary to insert one or more spaces between words. This spacing of the carriage is made possible by use of the Space Bar. When operated, the space bar command mechanism must:

- Engage the space cam clutch.
- Control the number of cycles to be performed by the space cam.

COMMAND MECHANISM

The space bar must operate the command mechanism for either of the following actions:

- Single carriage spacing.
- Repeat carriage spacing.

ASSEMBLY (REST POSITION)

The rest position of the Space Bar **85** is established by rubber stop **A**. The space bar is held in this position by its return springs attached to both sides of its frame.

Note: Only the right side is shown in figure 106.

The spring of latch pawl **88** holds the Space Bar Trip Lever **87** so that it prevents the Starting Lever **89** from releasing flange **D** (figure 107).

The Spacing Cam **15** is held at rest by the roller of the Space Bar Escapement Trip Lever **90** locating in one of three dwells on the cam.

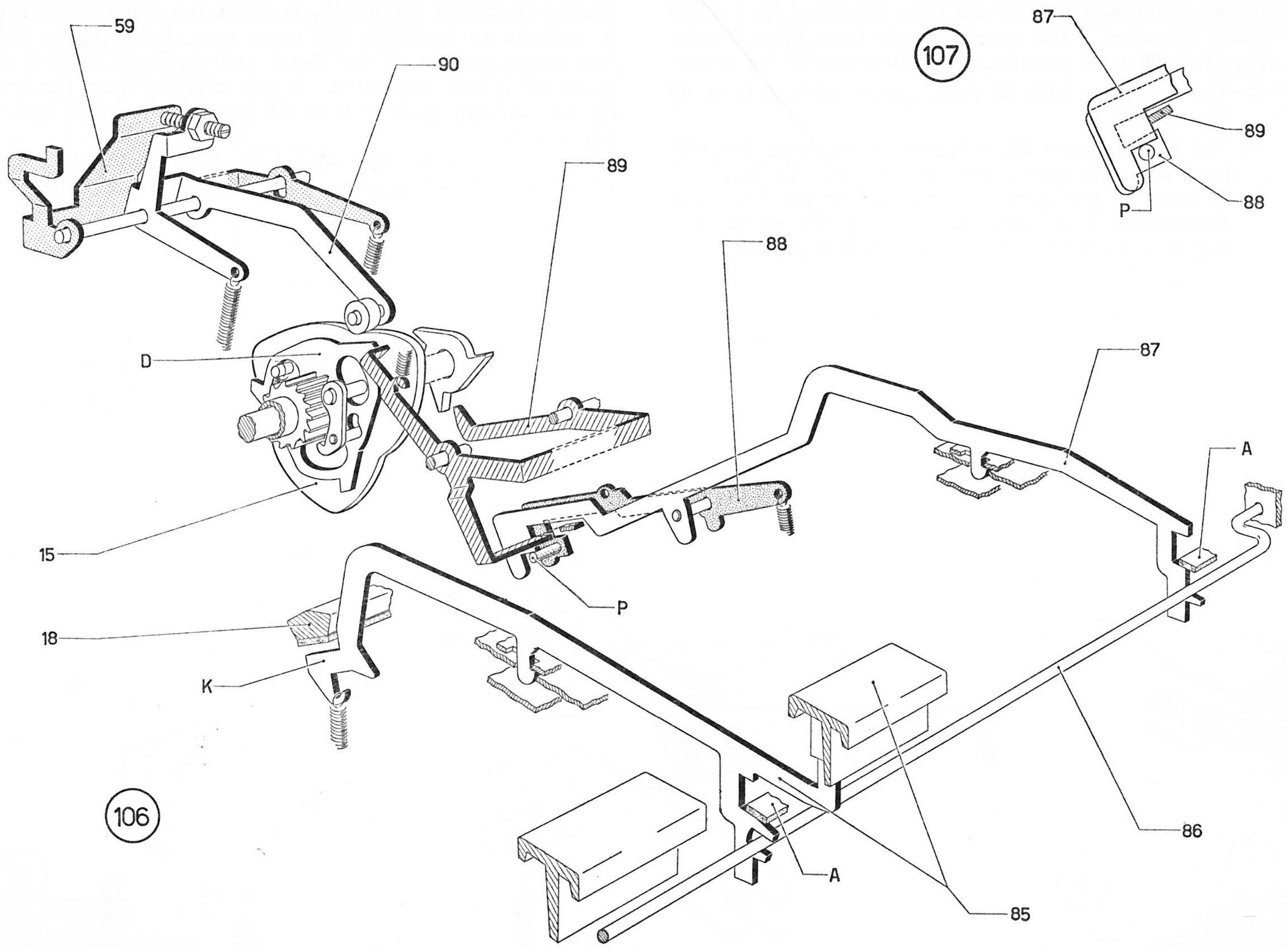
ACTIVATION

To activate the space cam it is necessary that the starting lever **89** releases flange **D**. The starting lever can be controlled in two different ways:

- Single spacing, in which extensions **K** will just contact the key lever locking bar **18**.
- Repeat spacing, in which extension **K** will raise the key lever locking bar.

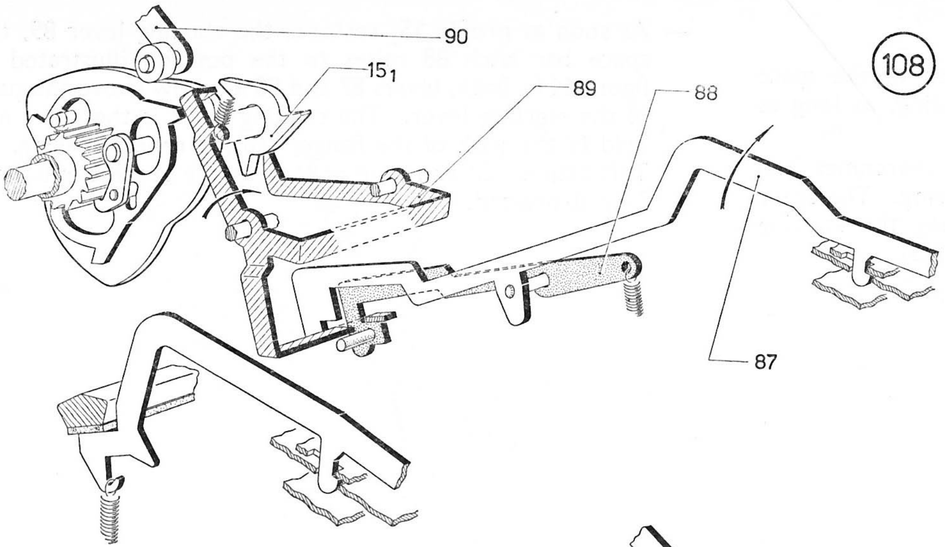
SINGLE SPACE CYCLE

When the space bar is depressed the extensions **K** of frame **85** are raised in contact with the key lever locking bar **18**. Connecting rod **86** rotates the space bar trip lever **87**, releasing the starting lever **89** and engaging the clutch.

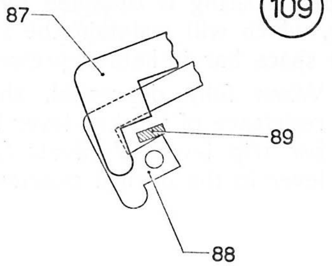

P
D
A
P
K
A

- In figure 108 the space bar has been depressed for a single space operation. The space bar trip lever **87** and space bar latch **88** have pivoted in the direction of the arrow.
  - The space bar latch **88** rests against starting lever **89** (figure 109).
  - The starting lever **89**, released by the space bar trip lever **87**, rests against the space cam profile **15_1**.
    Rotation of the space cam will actuate the Space Bar Escapement Trip Lever **90**, releasing the escapement dog in the same manner as described in a print cycle.

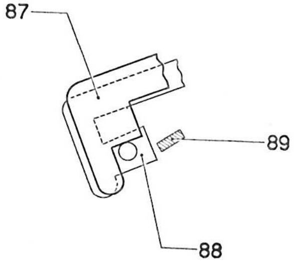
During the cycle profile **15_1** restores the starting lever **89** in position to disengage the space cam clutch (figure 110). The disengagement of the clutch will also take place if the space bar is held depressed. In this case the space bar latch **88** will prevent starting lever **89** from releasing the clutch, figure 111.
When the space bar is released the mechanism will return to its original rest position, as illustrated in figure 107.



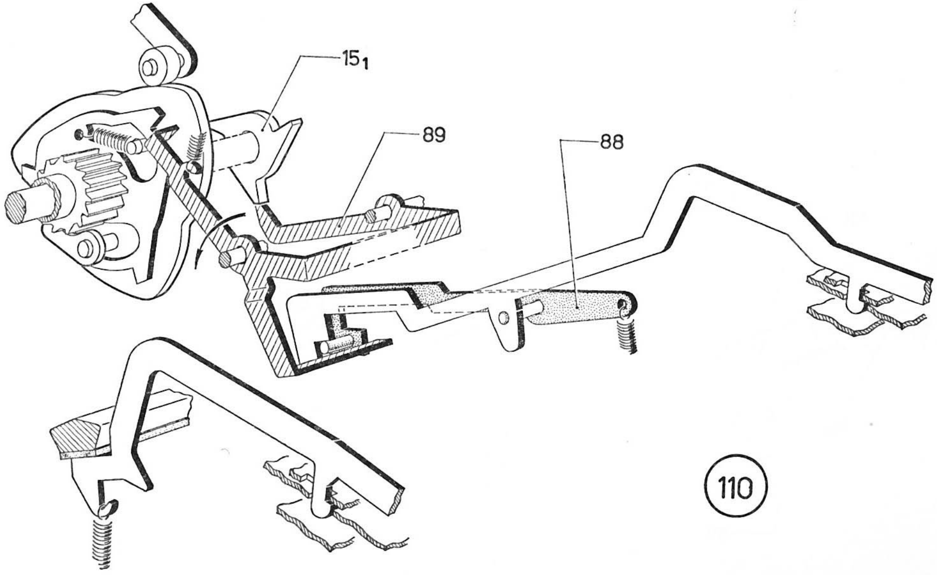
108



109



111



110

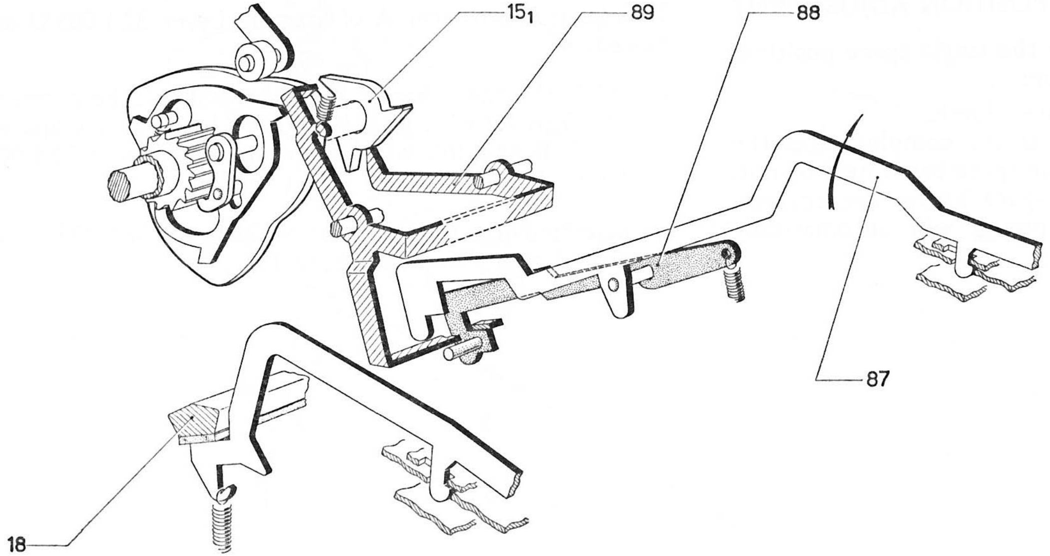
REPEAT SPACE CYCLE

Repeat spacing is obtained by full depression of the space bar, which will maintain the space cam rotating, as long as the space bar is held depressed.

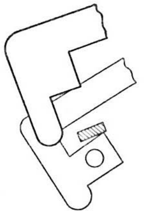
— When fully depressed, the space bar overcomes the resistance of the key lever locking bar spring. The space bar trip lever **87** pivots further, releasing the starting lever in the normal manner (figures 112-113).

— As soon as profile **15_1** restores the starting lever **89**, the space bar latch **88** raises to the position illustrated in figure 114. Both, levers **87** and **88** are now above the path of the starting lever. The starting lever is therefore not held in the path of the flange, causing repeat spacing.
This action will continue as long as the space bar is held fully depressed.

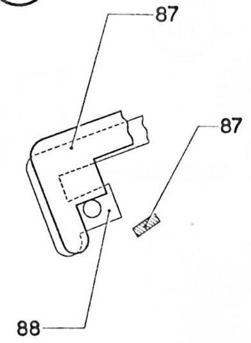
112



113



114



ADJUSTMENTS

1 - Figures 115-116-117

SPACE BAR MECHANISM REST POSITION ADJUSTMENT

With the space bar depressed to the single space position, the following actions must occur:

— Engagement of the space cam clutch.

— Disengagement of the clutch at the completion of the cycle, regardless of whether the space bar is held or not. If the adjustments of single space action are correct, the conditions for repeat spacing will automatically be correct.

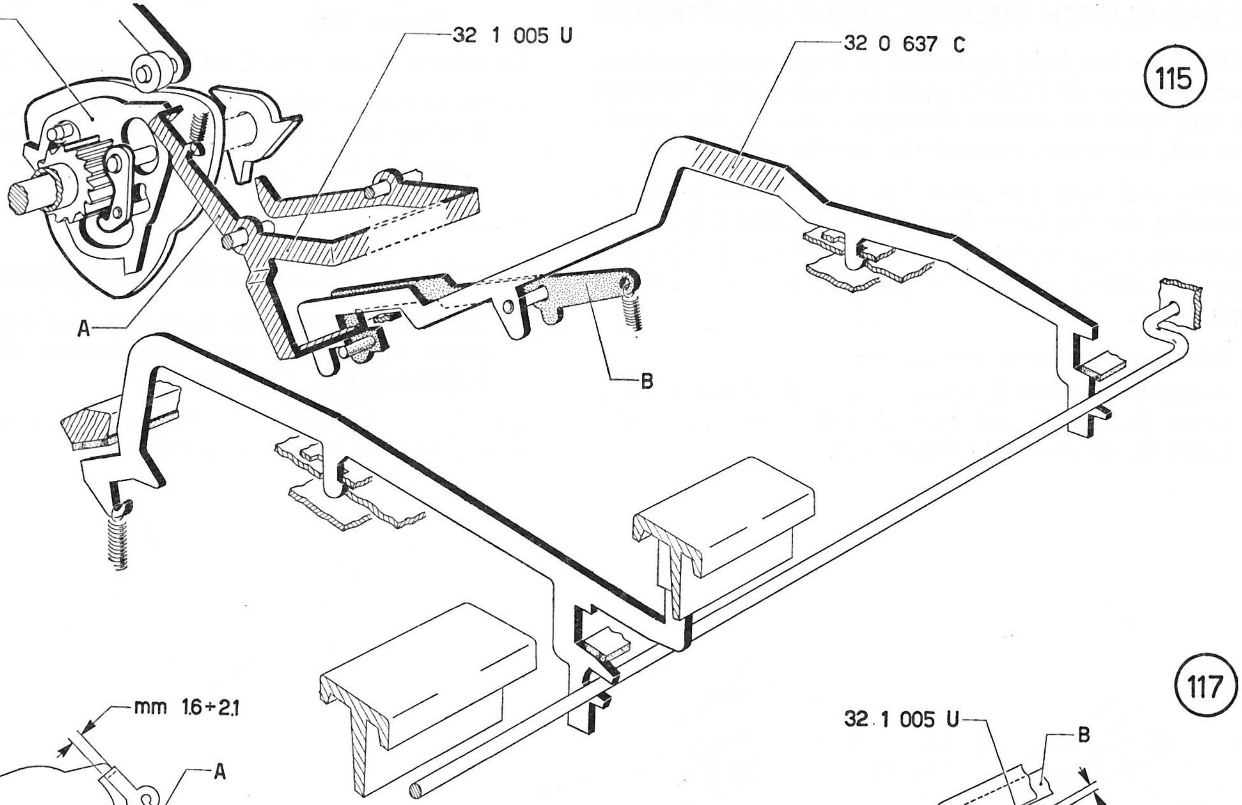
— With the space bar at rest, the Starting Lever 32 1 005 U must have a hold of 1.6 to 2.1 mm. (.063″ to .083″) on flange **D** as illustrated in figure 116.

To adjust: Form arm **A** of Starting Lever 32 1 005 U as required.

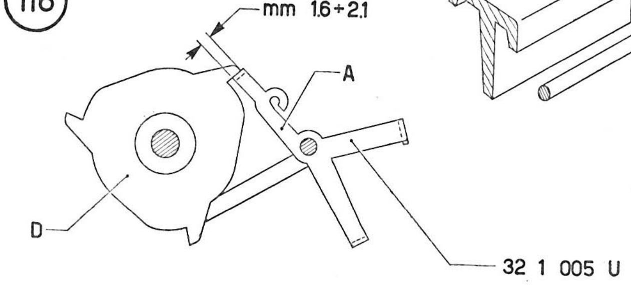
— With the space bar et rest, there should be a clearance of 1.0 to 1.2 mm. (.039″ to .047″) between the Space Bar Latch **B** and the wing of the Starting Lever 32 1 005 U, figure 117.

To adjust: Form the Space Bar Trip Lever 32 0 637 C at the hatchured area shown in figure 115.

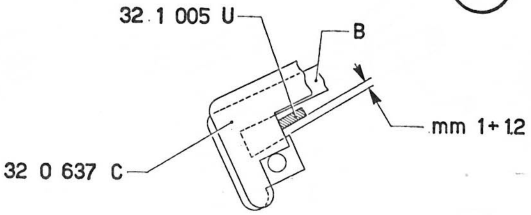
115


D
32 1 005 U
32 0 637 C
A
B

116


mm 1.6÷2.1
A
D
32 1 005 U

117


32 1 005 U
B
mm 1÷1.2
32 0 637 C

2 - Figures 118-119

SPACE BAR CLUTCH DISENGAGEMENT ADJUSTMENTS

With the space bar held depressed at single space position, the starting lever 32 1 005 U must be sufficiently restored during the cycle to ensure disengagement of the clutch. It must not, however, contact the profile of flange D.

— Depress and hold the space bar with its frame lightly contacting the Key Lever Locking Bar 32 0 621 C (fig. 118).

— Rotate the power shaft by hand until the Space Bar Starting Lever 32 1 005 U reaches the point of maximum restore (figure 118).

In this position there should be:

— A slight clearance **L** between wing **F** of the Starting Lever 32 1 005 U and extension **E** of the Space Bar Latch **B**, as shown in figure 119.

— A clearance of .1 to .3 mm. (.004″ to .012″) between flange **D** and the wing of the Starting Lever 32 1 005 U (figure 119).

To adjust: Form arm **C** of Starting Lever 32 1 005 U.

— With the machine still in this condition, check that wing **F** of the Starting Lever will be held by extension **E** of the Space Bar Latch **B**.

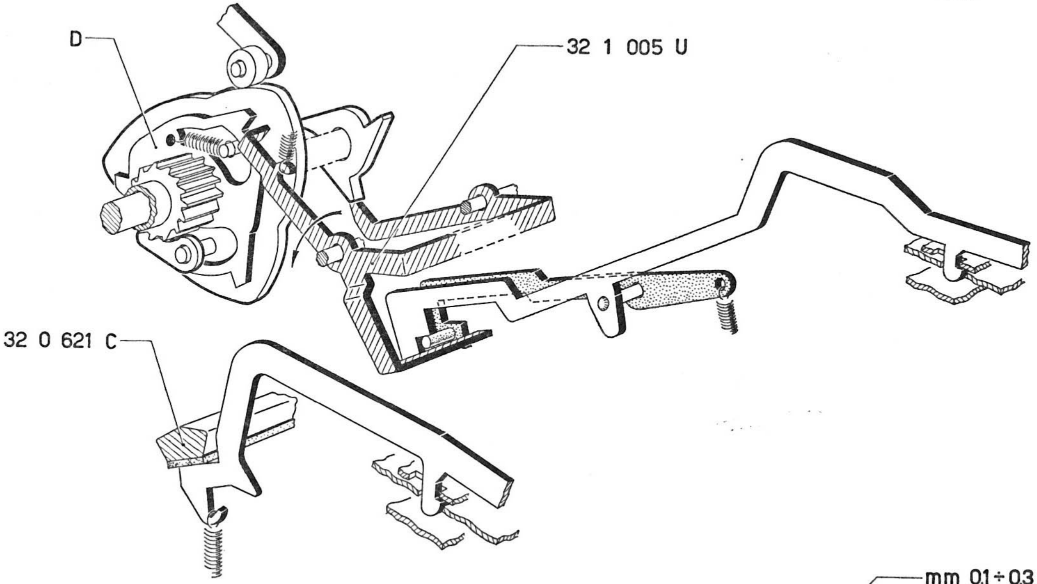
3 - Figure 106

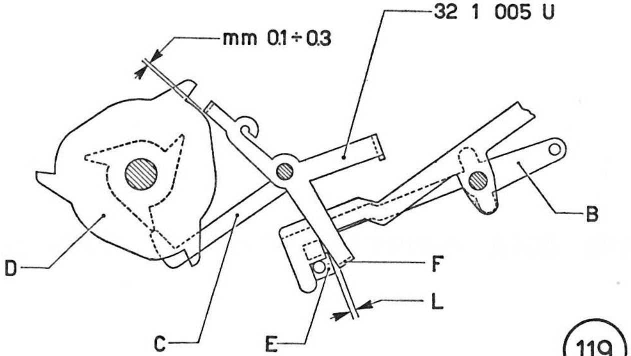
SPACE BAR ESCAPEMENT TRIP ADJUSTMENT

— The space bar action must trip the escapement in the same manner as the type action (See Escapement Adjustment 2, Page 74).

To adjust: Regulate the adjusting screw of the Space Bar Trip Lever **90** (figure 106, Page 159).

(118)





(119)

RECIPROCAL CONTROL BETWEEN TYPING AND SPACING

FOREWORD

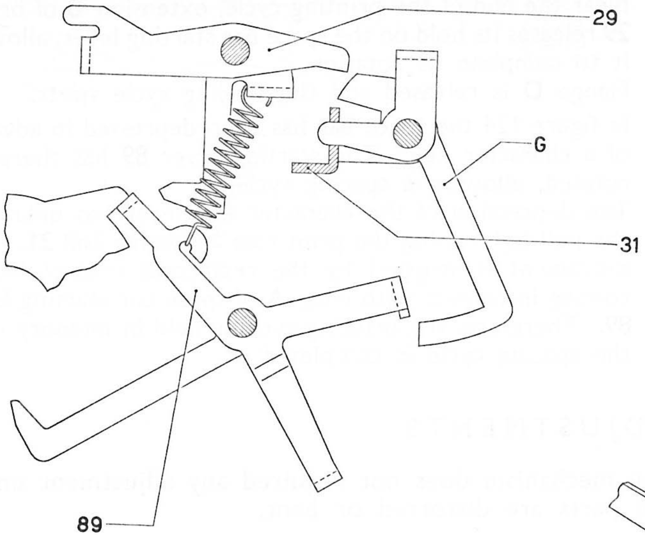
The mechanisms which control the print cam clutch and space cam clutch respectively, also provide a reciprocal control between each other.
This control operates in the following manner.

- During a printing cycle, the space bar may be depressed, but the spacing cycle can not take place until the completion of the print cycle.
- Viceversa, during a spacing cycle, a character key may be depressed thus activating the print cam clutch. However, the print cycle can only start after the spacing cycle is complete.

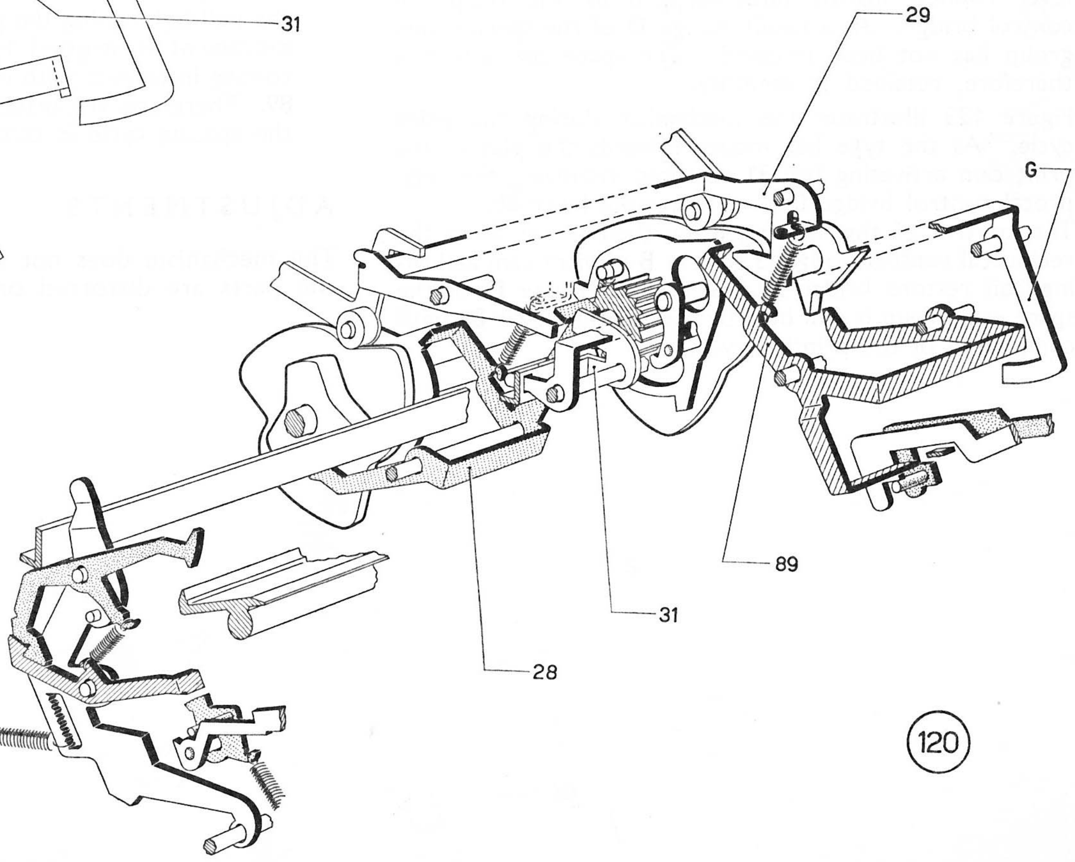
It is therefore possible to always maintain the respective cycles in correct sequence. The resulting typewriteen work will have alternate spacing and character printing.

ASSEMBLY (REST POSITION)

Figures 120 and 121 represent the parts which provide the reciprocal control in their rest position.
Beside the parts already covered, the figure also illustrates the Reciprocal Control Bridge **G**, which is controlled by the print cam activating bail **31**.



(121)



(120)

ACTIVATION

- Figure 122 indicates that a character key lever had been depressed in advance of the space bar. As a result, the print cam activating bail rotated the hook of Reciprocal Control Bridge **6** under wing **A** of the space bar starting lever **89.**

  Since the space bar had also been depressed, the starting lever rotated slightly until stopped by the reciprocal control bridge. As a result, flange **D** of the spacing cam group has not been released. The space bar action is therefore, retained in memory.
- Figure 123 illustrates the mechanism during the print cycle. As the type bar moves towards the platen, the print cam activating bail **31** restores, removing the reciprocal control bridge from the starting lever **89.**

  The control of the starting lever then passes from the reciprocal control bridge **G** to arm **B** of print cam activating bail restore bridge **29.** Therefore, flange **D** of the space cam group is still held by the starting lever **89** until completion of the printing cycle.

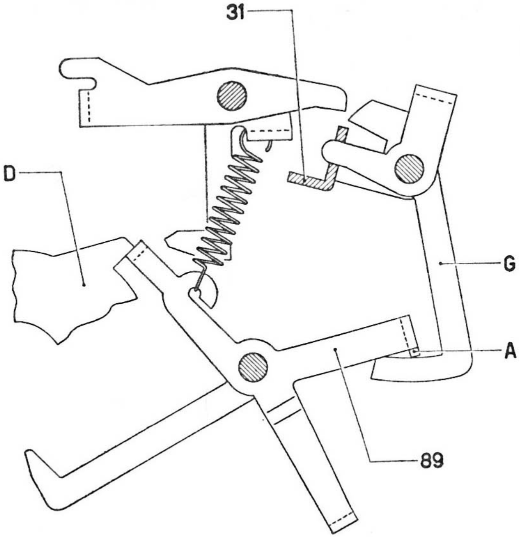
  Near the end of the printing cycle, extension **B** of bridge **29** releases its hold on the space bar starting lever, allowing it to complete its rotation.

  Flange **D** is released and the spacing cycle starts.
- In figure 124 the space bar has been depressed in advance of a character key. The starting lever **89** has therefore rotated, allowing a spacing cycle.

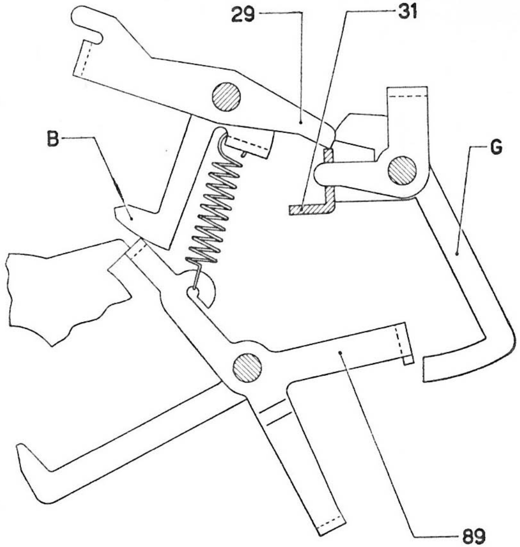
  The depression of the character key lever has unlatched the pull link raising the print cam activating bail **31**. This movement is stopped by the reciprocal control bridge coming in contact with wing **A** of space bar starting lever **89.** Therefore, the printing cycle is held in memory until the spacing cycle is completed.

ADJUSTMENTS

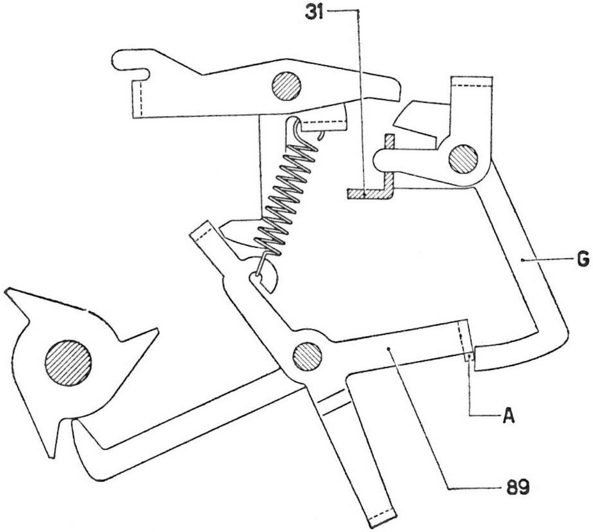
The mechanism does not required any adjustment unless the parts are distorted or bent.



(122)



(123)



(124)

INPUT CONTROL

FOREWORD

On conventional typewriters, the simultaneous depression of two character keys will cause the type bars to collide and possibly jam as they approach the platen. On the Praxis 48 this inconvenience is eliminated. If two or more character keys are depressed at the same time, the cycle of the machine will have the following results:

- The type bars are prevented from rising far enough to print or collide.
- The machine cycles, advancing the carriage one space.
- The printing cam clutch can not be released, de-activating the keyboard.

To re-activate the keyboard, it is necessary to operate the backspace key, which results in the following:

- Backspace the carriage.
- Relatch the pull links, if necessary.
- Reset the controls for the printing cam clutch.

The command mechanism of the backspace key will engage the service cam clutch so that the cam group will:

- Activate the backspace mechanism.
- Activate the reset mechanism.

As the keyboard de-activation operates in a different manner, depending on whether the impression control is set at minimum or maximum, each operation must be examined separately.

INPUT CONTROL - IMPRESSION AT MINIMUM

When two keys are depressed simultaneously, the input control mechanism deactivates the keyboard. This is possible because, with the impression control set at minimum, the type action bail can not complete its rotation, when opposed by two springs.

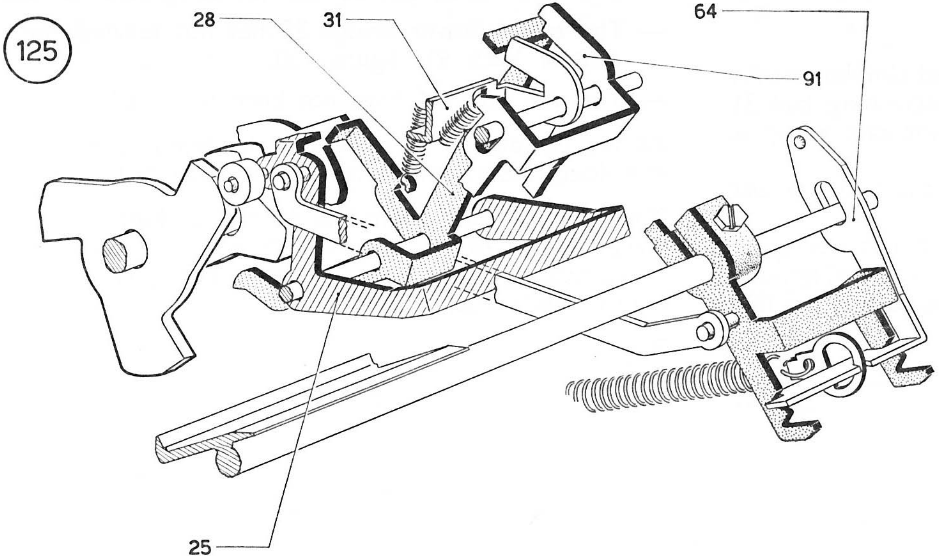
ASSEMBLY (REST POSITION)

Figure 125 shows the section of the type action mechanism involved in input control, at rest, together with the Input Control Latch **91**. The input control latch rests on the starting levers **28** as illustrated in figure 126.

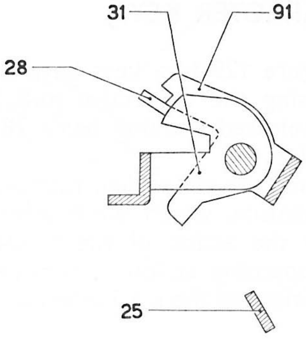
ACTIVATION (SINGLE KEY DEPRESSION)

Figure 127 shows the mechanism during a normal typing cycle.
The cam follower bridge **25** rotates the input control latch **91** above the wing of the starting lever **28** as illustrated in figures 127-128. At the completion of the cycle, starting lever **28** resumes its normal rest position against the print cam activating bail **31** (figure 126).

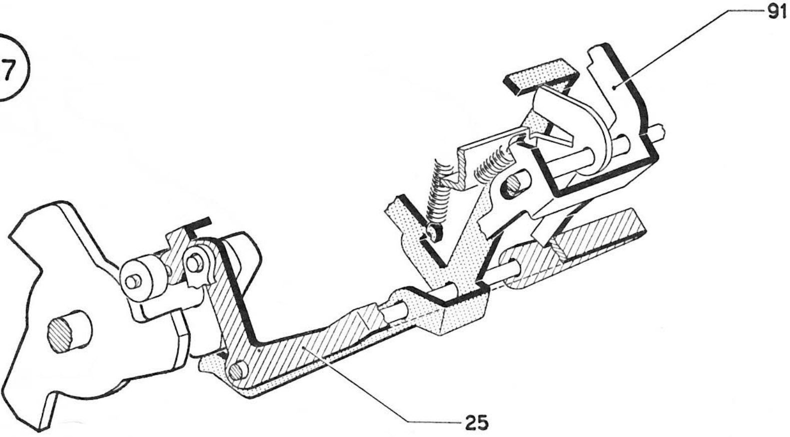
(125)



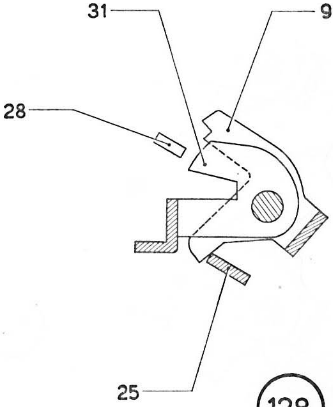
(126)



(127)



(128)



ACTIVATION (SIMULTANEOUS DEPRESSION OF TWO CHARACTER KEYS)

In figure 129 two keys have been depressed simultaneously, releasing the respective pull links. The activating bail **31** has released starting lever **28** and the print cam group is rotating.
As the type action bail rotates, it operates the two type bar mechanisms which were selected.
Since the action of the printing spring can not overcome the opposing action of two impression control springs, the conditions of the mechanism will be as illustrated in figure 129.

— The type action bail **36** has not completed its rotation.

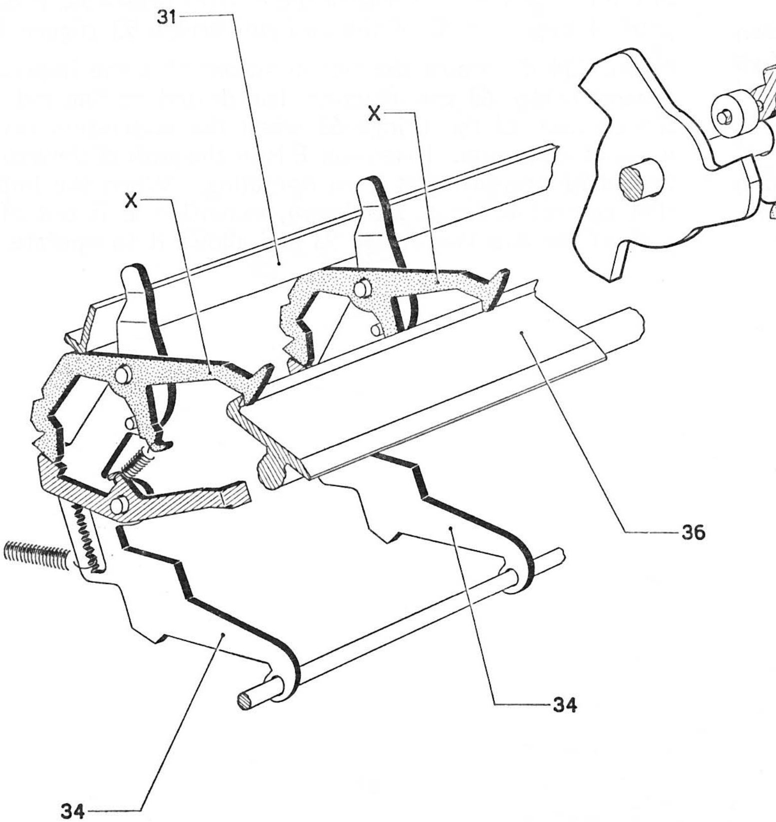
— The cam follower bridge **25** has not rotated the input control latch **91**, figure 130.

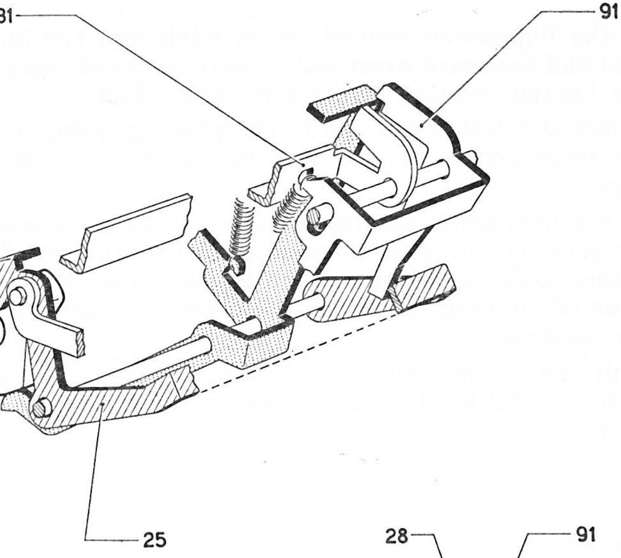
— The pull links **X** have not been relatched.

At the completion of the cycle, the input control latch **91** is holding the starting lever **28**, as illustrated in figure 131.

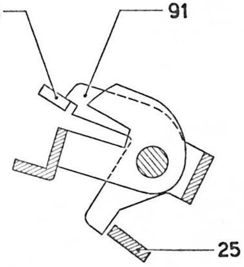
The print cam activating bail **31** can no longer release the starting lever **28**. It is obvious that, even though the print cam activating bail **31** could be rotated if the pull links restores, a print cycle could not be started.

129

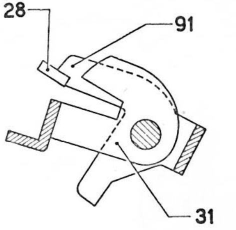




130



131



INPUT CONTROL - IMPRESSION AT MAXIMUM

With the impression control set at minimum, the input control and keyboard deactivation were obtained, because of the limited rotation of the type action bail.

This limited rotation was due to the printing spring being unable to overcome the action of two impression control springs.

With the impression control set at *maximum*, the action of the printing spring is increased to the extent that *two* type bars could raise high enough to jam. The additional rotation of the type action bail could prevent deactivation of the keyboard.

For this reason, the required actions are obtained through the use of additional parts known as the anti jam mechanism.

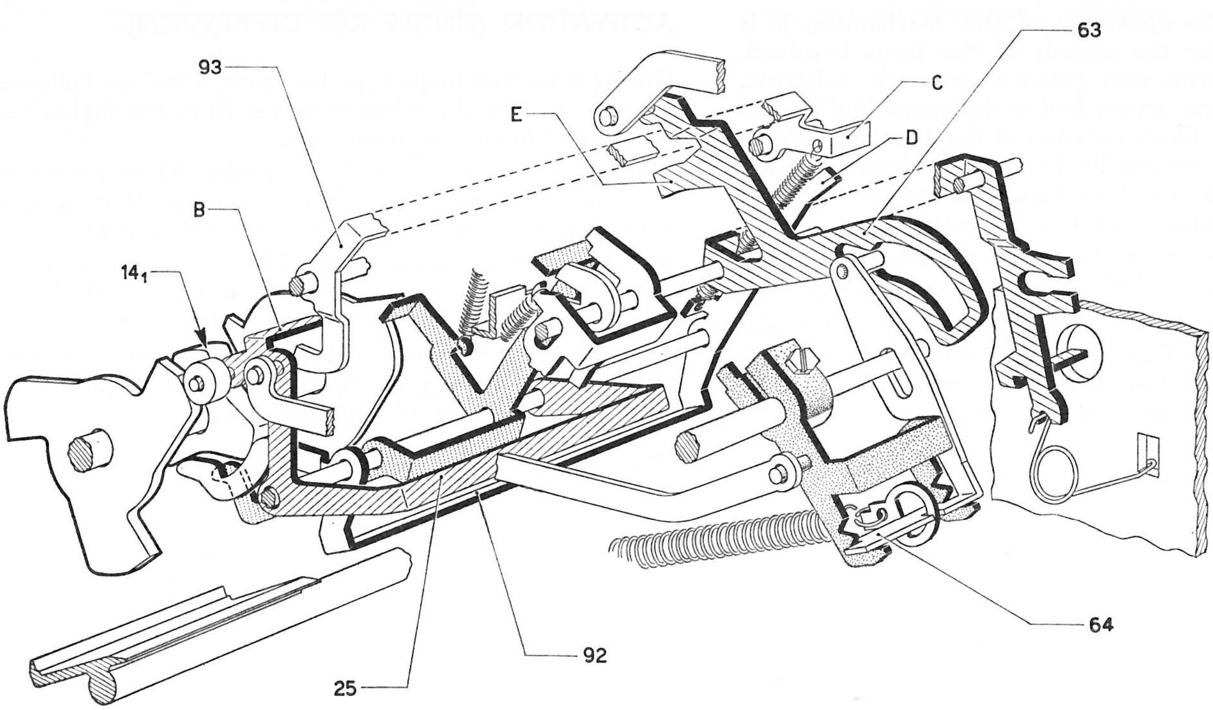
ASSEMBLY (REST POSITION)

Figure 132 illustrates the input control mechanism together with:

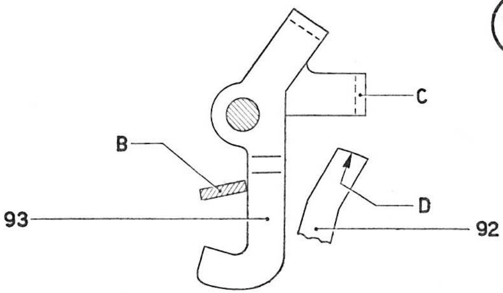
- Control Bridge **92**, resting on profile **14**$_1$ of the print cam.
- Anti-Jam Bridge **93**, which is controlled by wing **B** of Cam Follower **25**.

In the rest position, arm **D** of the control bridge **92**, is in the path of extension **C** of the anti-jam bridge **93** (figure 133).

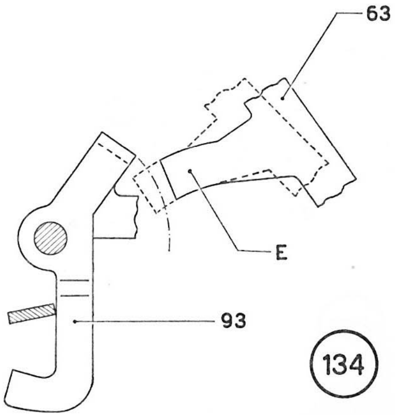
Figure 134 illustrates the two positions that the impression control bridge **63** can assume. The dotted outline indicates the position of the bridge **63** when the impression control is set at ***minimum***. Extension **E** is in the path of the anti jam bridge **93** preventing it from operating. When the impression control is set at ***maximum***, extension **E** is out of the path of the anti jam bridge **93** and allows it to operate.



132



133



134

Before describing the operation of this mechanism, it is necessary to consider the speeds of the parts involved. The speed of the print cam group is constant, whereas, the speed of the type action bail varies according to the impression settings. Since rotation of the anti jam control bridge is controlled by profile **14_1**, it will always operate at the same time. The rotational speed of the cam follower however varies according to the following:

— The direct action obtained through the printing spring.
— The opposing action of the impression control springs.

As a result, during normal operation, the type action bail rotates very rapidly. During a cycle activated by simultaneous depression of two character keys, the speed of the type action bail is greatly reduced.

ACTIVATION (SINGLE KEY DEPRESSION)

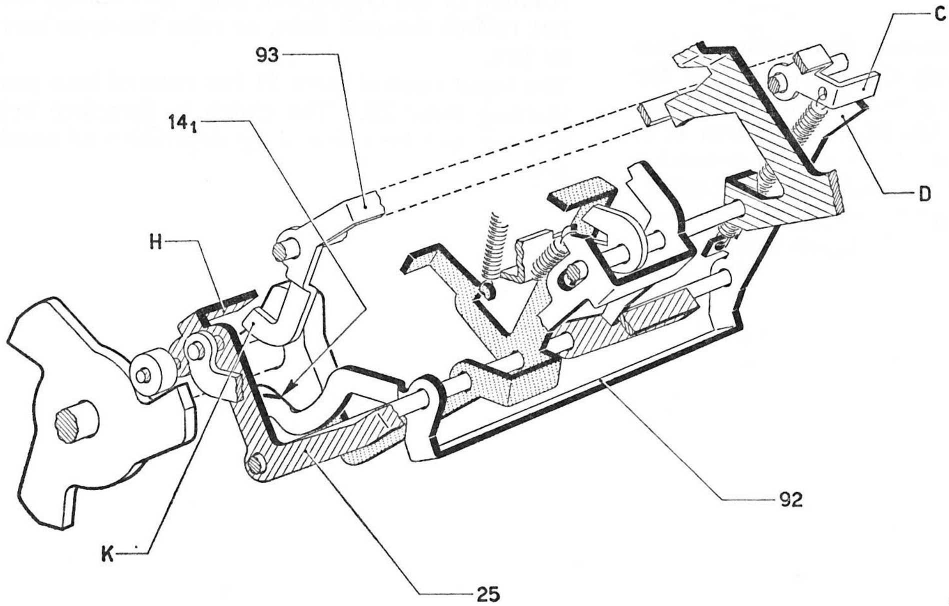
During a normal single type bar cycle, the Cam Follower **25** rotates very rapidly when it moves from the higher to the lower profile of the print cam.

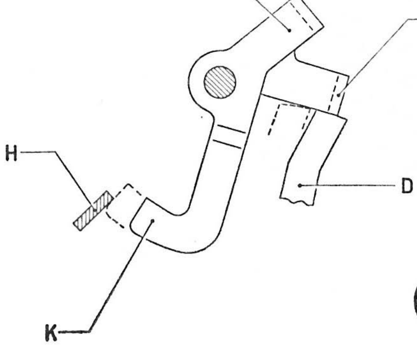
This movement allows Anti-Jam Bridge **93** to rotate, however, after a very short travel the bridge **93** is stopped as wing C contacts arm D of the Control Bridge **92**.

Profile **14_1** now causes bridge **92** to release the Anti-Jam Bridge **93**, which rotates until stopped by wing H of the cam follower, as shown in dotted outline in figure 136.

The release of the anti-jam bridge was too late to allow its hook K to latch wing H. Consequently, it did not interfere with the movement of the type bar.

135





136

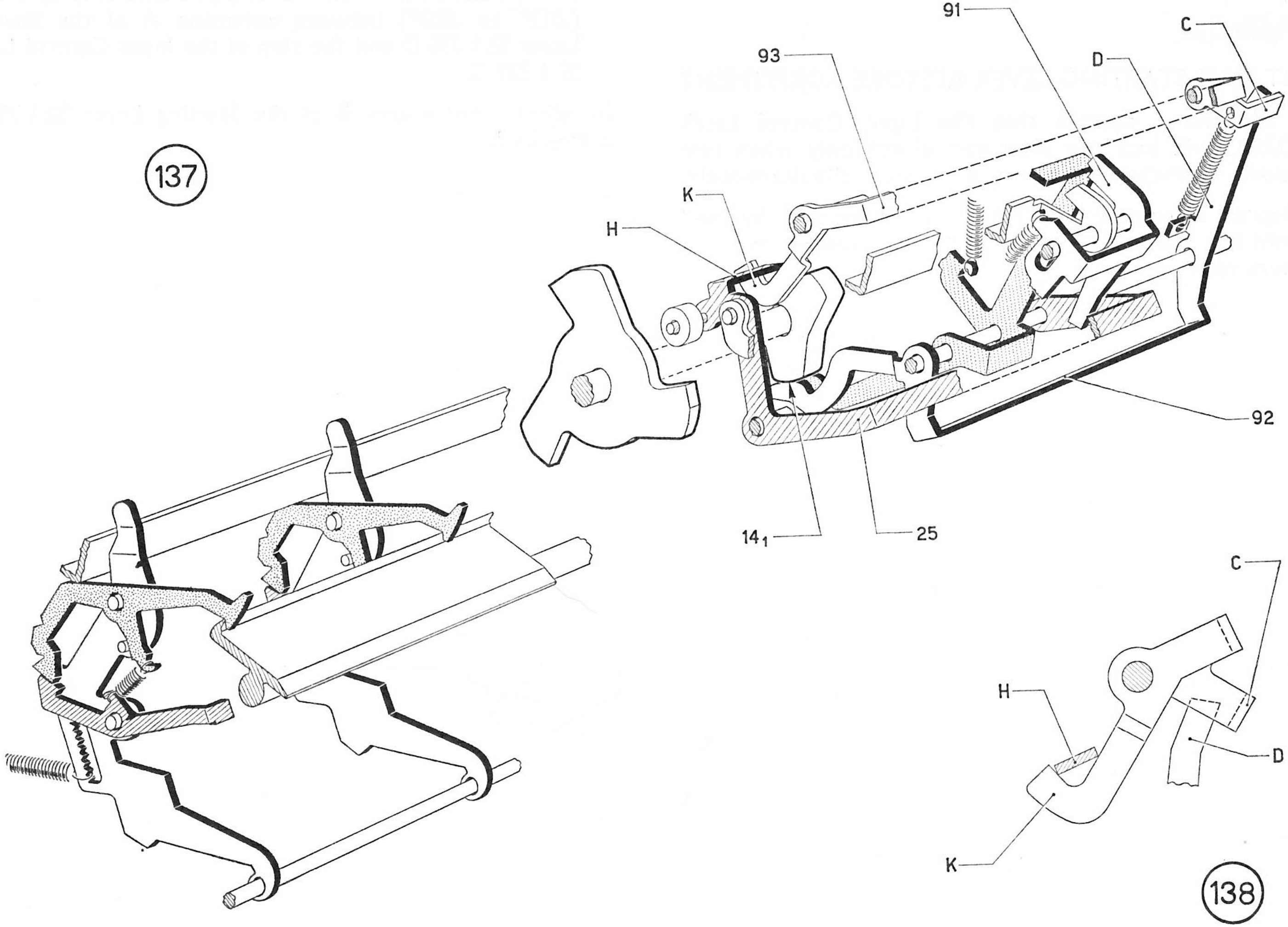
ACTIVATION (SIMULTANEOUS DEPRESSION OF TWO CHARACTER KEYS)

As already discussed, the simultaneous depression of two character keys will cause a relatively slower rotation of the cam follower **25**. This results in the Anti Jam Bridge **93** also moving slower. Therefore, as profile $\mathbf{14_1}$ rotates, arm **D** of the control bridge **92** is moved out of the path of extension **C** of anti jam bridge **93** in time for it to make its full rotation. Hook **K** will latch the wing **H** of cam follower **25**, thus preventing its complete movement, as shown in figure 138.

The restricted movement of cam follower **25** prevents complete rotation of the type action bail. This limited movement does not relatch the pull links, or raise the type bars high enough to jam.

The input control latch **91** has rotated into position to hold starting lever **28**. The clutch is therefore held disengaged and can not be released by depression of another character key.

137



138

ADJUSTMENTS

1 - Figure 139

PRINT CAM STARTING LEVER RESTORE ADJUSTMENT

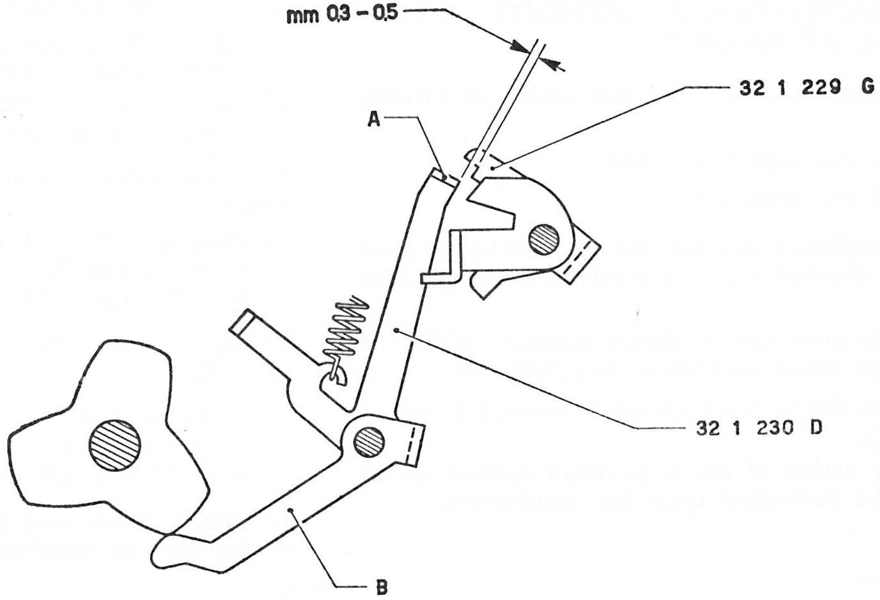
This adjustment ensures that the Input Control Latch 32 1 229 G will lock the print cam clutch only when two or more character keys are depressed simultaneously.

— Depress a character key, rotate the power shaft by hand until the Starting Lever 32 1 230 D has reached its maximum restore.

— In this position there should be a clearance of .3 to .5 mm. (.012″ to .020″) between extension **A** of the Starting Lever 32 1 230 D and the step of the Input Control Latch 32 1 229 G.

To adjust: Form arm **B** of the Starting Lever 32 1 230 D as required.

139



The keyboard deactivation, with the impression control at minimum, is automatically obtained if the adjustments of the printing spring have been made correctly. These adjustments were covered in the section on printing adjustments.

2 - Figures 140-141-142

KEYBOARD DEACTIVATION ADJUSTMENTS - IMPRESSION CONTROL AT MAXIMUM

As previously discussed, the anti jam action is directly dependent on:

— The speed of the type action bail.

— The speed of the print cam.

The action of keyboard deactivation and anti-jam, must consequently be checked with the machine working under power.
The speed of the print cam is always constant while the speed of the type action bail varies in relation to:

— The energy of the printing spring (increased in upper case position).

— The opposing action of the impression control spring related to the individual type bar mechanism.

The conditions required are:

— Prevent jamming of the type bars.

— Deactivate the print and space cam clutches anytime two type bars are raised simultaneously.

Since this control has to be checked under power, it is extremely important that the reciprocal rest positions of the de-activation mechanism are properly adjusted.

— Figure 140 illustrates the rest position of the mechanism.

— Figure 141 illustrates the reciprocal position of the parts during regular typing.

— Figure 142 illustrates the reciprocal of the mechanism when two type bars have been depressed simultaneously.

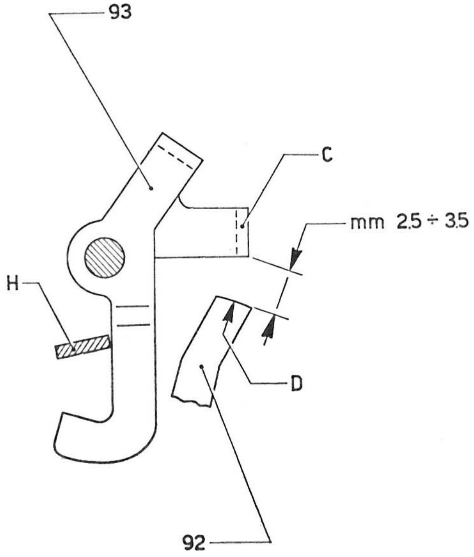
Particular importance must be given to the following adjustments.

— Wing **C** of the anti-jam bridge **93** should clear the arm of control bridge **92** by a distance of 2.5 to 3.5 mm. (.098" to .138") figure 140.

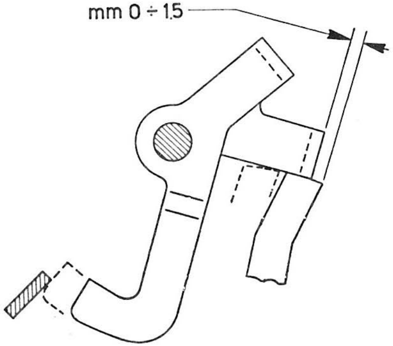
To adjust: Form the anti-jam bridge **93** to raise or lower Wing **C**.

— During a single type bar operating cycle, wing **C** should contact the arm of the control bridge with an overlap of .0 to 1.5 mm. (.0" to .059") as illustrated in figure 141.

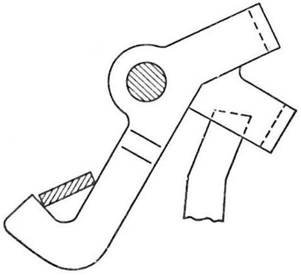
To adjust: Form wing **C** of the anti-jam bridge **93** forward or rearward as required.



140



141



142

KEYBOARD REACTIVATION - BACKSPACING

FOREWORD

When the keyboard is deactivated, due to the simultaneous depression of two character keys, the machine is in the following condition:

- — The carriage has advanced one space without the character printing.
- — The respective pull links may be unlatched.
- — The keyboard is deactivated.

The reactivation mechanism must therefore perform the following functions:

- — Return the carriage one space to its original position.
- — Relatch, if necessary, the pull links.
- — Reactivate the keyboard.

These functions are performed by the rotation of the service cam group, the profiles of which will:

- — Inner profile - actuate the backspace mechanism.
- — Outer profile - reset the pull links, unlock the clutch.

NOTE - As the backspace key is also utilized for normal backspacing, it is designed to operate or repeat actions.

COMMAND

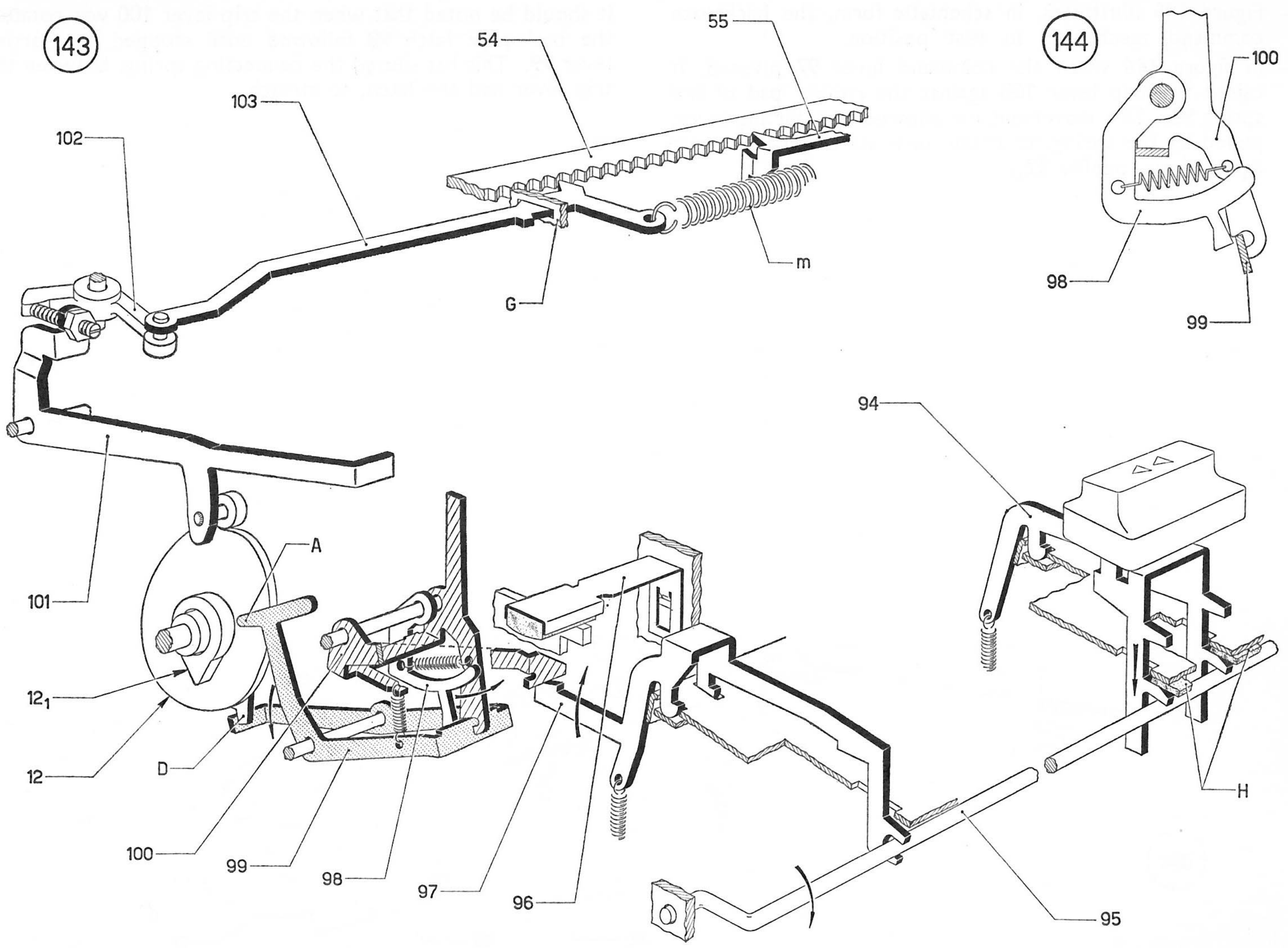
The depression of the backspace key causes the command mechanism to engage the service clutch.

ASSEMBLY (REST POSITION)

The Backspace Pawl **103** is held in its rest position through the crank **102** and Actuating Arm **101**. The actuating arm establishes the rest position of the service cam group, through the action of spring **M**.
The clutch is held disengaged by the starting lever latched in its rest position by Trip Lever **100**, figure **144**. The Command Lever **97** holds connecting rod **95** raised against the lower extension of the backspace key stem. The key lever in turn rests against the rubber pad under the top plate of the keyboard housing by the action of its return spring.

ACTIVATION OF COMMAND MECHANISM

Depression of the backspace key, through connecting rod **95**, pivots the command lever **97** in the direction of the arrow. This movement rotates trip lever **100** until stopped by the rubber pad of leaf spring **96**.
Starting lever **99** rotates until its arm **A** contacts profile 12_1, thus releasing flange **D**, allowing the service cam group to rotate with the power shaft.

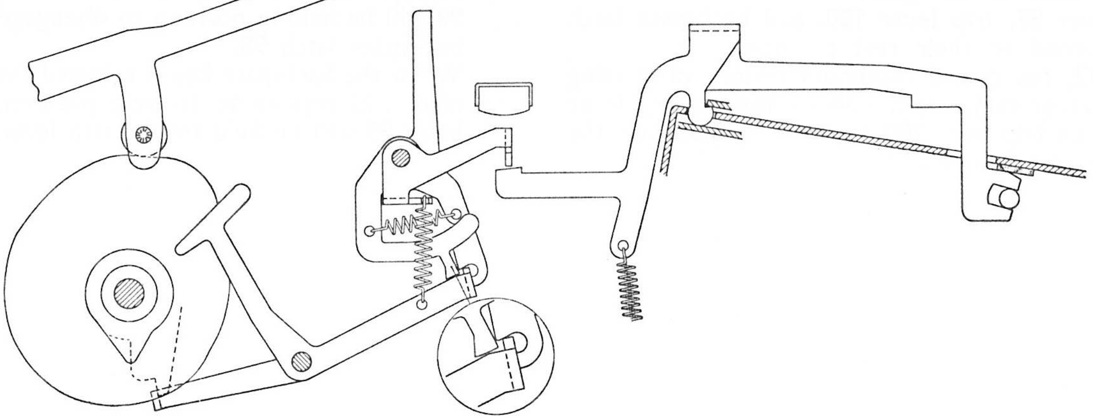

143

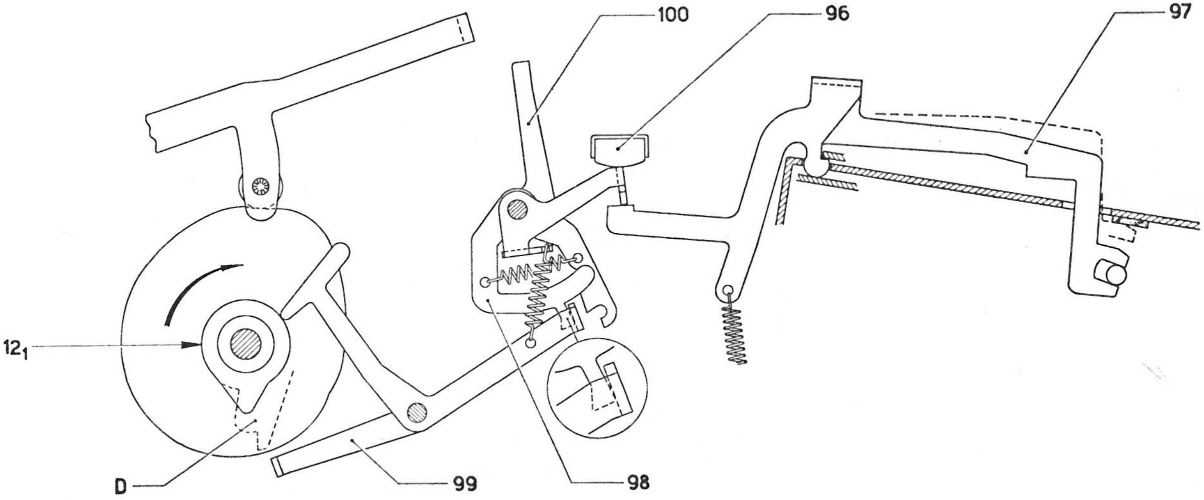
144

- Figure 145 illustrates, in schematic form, the backspace command mechanism in rest position.
- In figure 146 when the command lever **97** pivoted, it raised the trip lever **100** against the rubber pad of leaf spring **96**. This movement has allowed the starting lever, pulled by the spring, to rotate until its extension comes against cam profile $\mathbf{12_1}$.

It should be noted that when the trip lever **100** was rotated, the backspace latch **98** followed until stopped by starting lever **99**. This has caused the connecting spring, between the trip lever and the latch, to stretch.

145



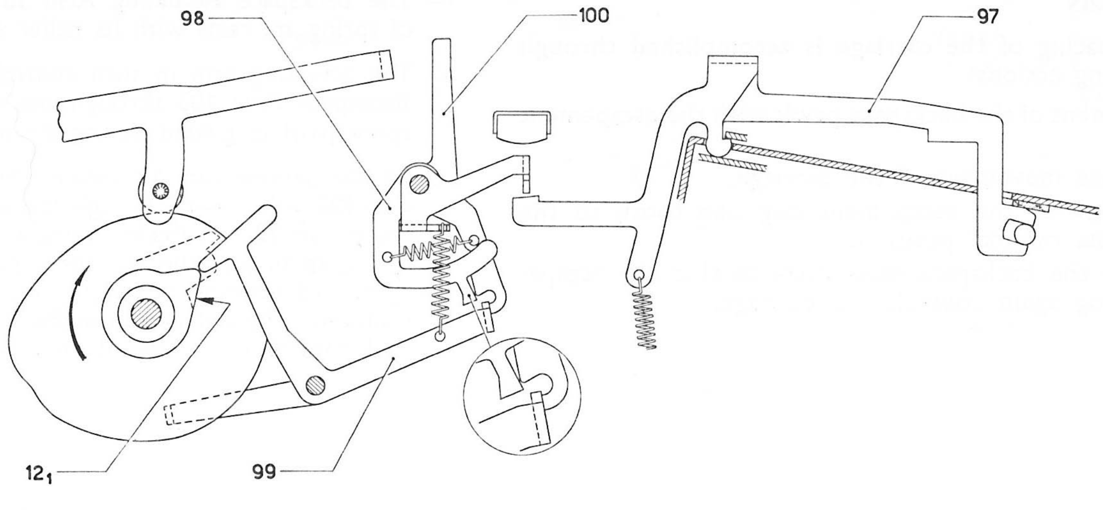


146

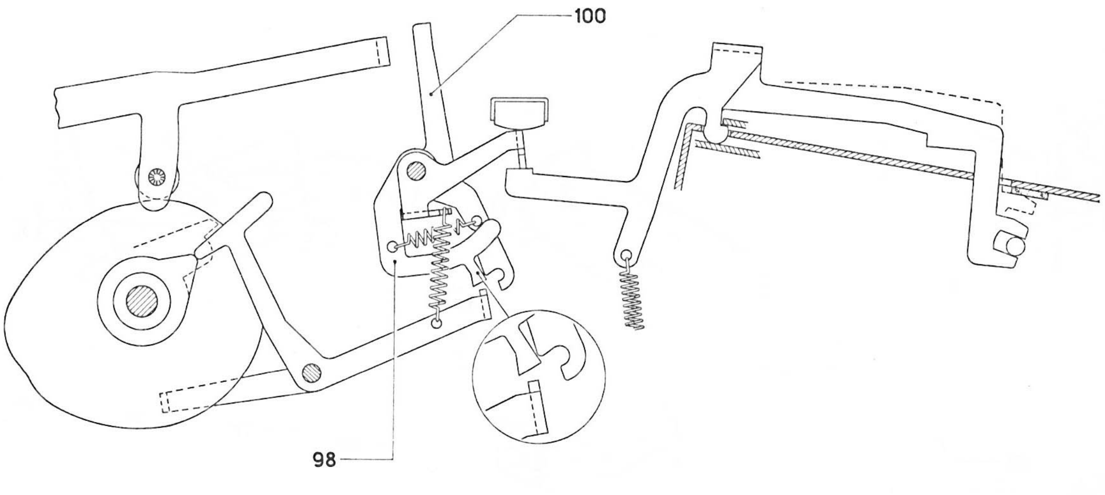
— In figure 147, the backspace key lever is shown released before completion of the cycle.
Command lever **97**, trip lever **100**, and backspace latch **98** have returned to their rest position.
The profile **12_1** has caused maximum restore of starting lever **99**. Further cam rotation allows the starting lever **99** to relatch on trip lever **100**, in order to disengage the clutch at the completion of the cycle.

— Figure 148 illustrates the command mechanism with the backspace key held depressed. In this case, starting lever **99** will be held in position to disengage the clutch by the backspace latch **98**.
When the backspace key is released the command mechanism will restore to its rest position, and the starting lever **99** will be held by the trip lever **100**.

147



148

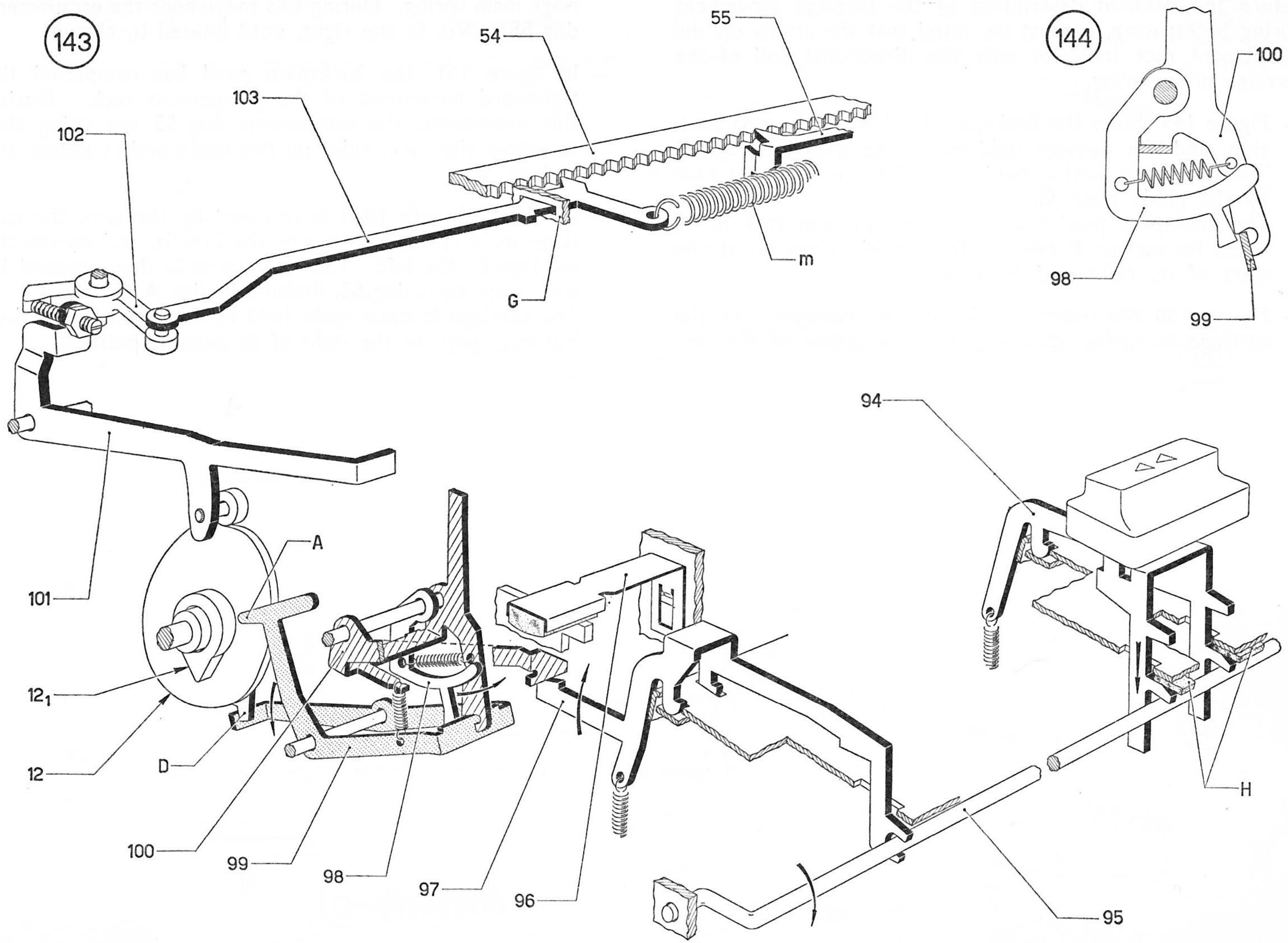


ACTIVATION

The backspacing of the carriage is accomplished through the following actions:

- Engagement of the backspace pawls with the escapement rack.
- Backspace movement of the carriage.
- Relocation of the escapement dog one tooth to the left of its original position.
- Restore the backspace mechanism so that the escapement dog again controls the carriage.
- The Backspace Actuating Arm **101**, through the action of spring **m**, rests with its roller on the service cam **12**.
- The actuating arm in turn controls the position of the Backspace Pawl **103** through the crank **102**. The backspace pawl is guided during its movement by plate **G**.
- As the service cam **12** rotates, the backspace actuating arm **101** will lower, through the action of spring **m** and the profile **12**. As the actuating arm lowers, it allows the spring **m** to pull the backspace pawl to the right. The continued rotation of the service cam restores the mechanism. The detailed movement of the carriage during backspace will be covered on the following page.

143



144

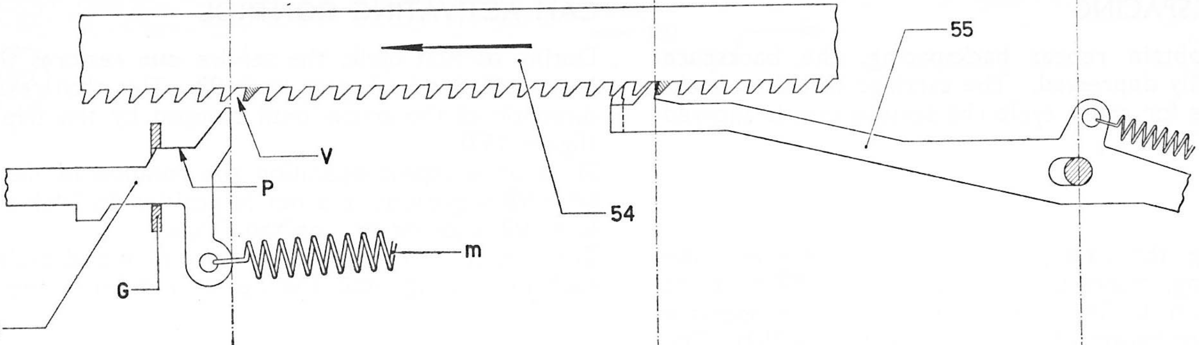
Before the detailed description of the carriage movement during backspacing, it must be noted that the arrow on the escapement rack indicates only the directional pull of the carriage main spring.

— Figure 149 shows the Backspace Pawl **103** in its rest position, and the carriage held by the escapement dog **55**. The backspace pawl is held clear of the escapement rack by the guide plate **G**.
The backspace pawl engages the escapement rack at **V**, when its surface **P** releases from guide plate **G**, at the start of its rightward movement.

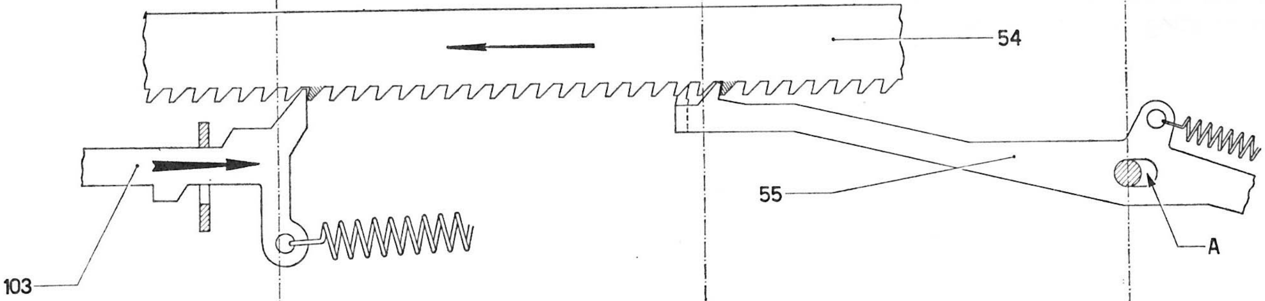
— Figure 150 illustrates the backspace movement of the carriage as spring **m** overcomes the action of the carriage main spring. During this movement the escapement dog **55** moves to the right, until limited by slot **A**.

— In figure 151, the backspace pawl has completed the rightward movement of the escapement rack. During this movement, the escapement dog **55** not being able to follow the rack, rides up the tooth and re-enters the rack at V_2.

— As the backspace pawl is restored by the cam, the carriage main spring overcomes the inertia, and moves the carriage to the left. This movement is then stopped by the escapement dog **55**, limiting in slot **A**.
The carriage is once again held by the escapement dog, but one space to the right of its original position.



149



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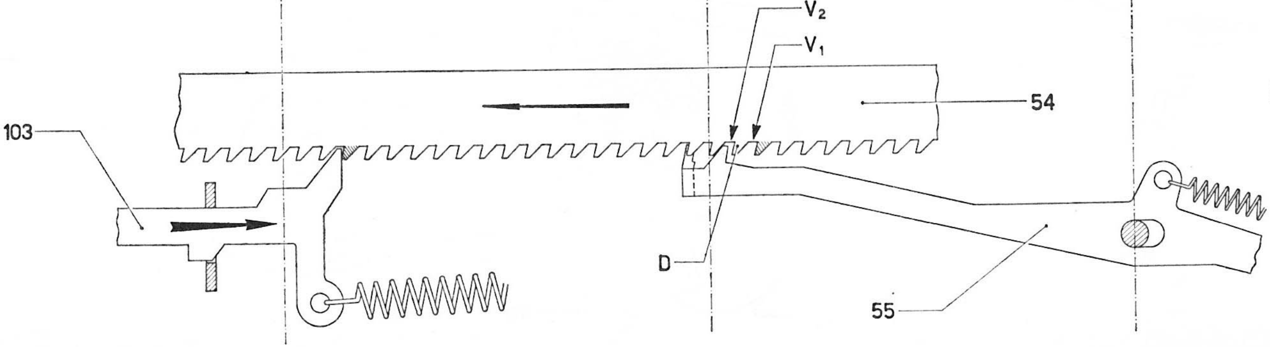


151

REPEAT BACKSPACING

In order to obtain repeat backspacing, the backspace key must be fully depressed. The carriage will then backspace one space for every cycle the service cam is allowed to rotate.

COMMAND

Fully depressing the backspace key until it contacts the keyboard housing, causes the Command Lever **97** to pivot further than normal. This is possible because the operator overcomes the resistance of leaf spring **96** (figure 152). The command lever rotates the Trip Lever **100**, releasing the Starting Lever **99**, which in turn prevents the Backspace Latch **98** from rotating with the trip lever.

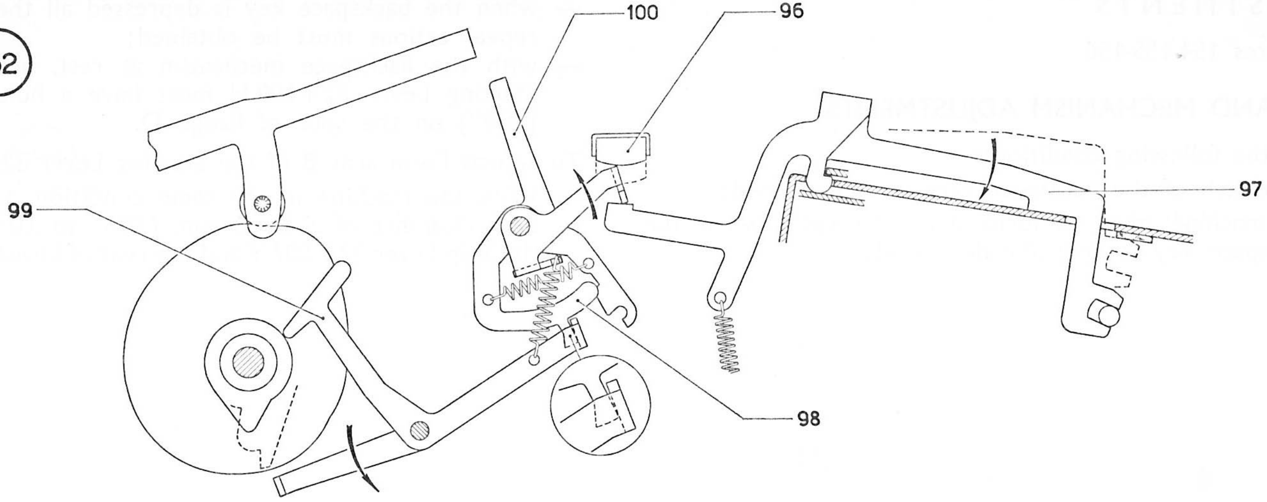
CAM ACTIVATING CONTROL

During its first cycle, the service cam restores the starting lever releasing backspace latch **98**. This than rotates in the direction of the arrow until stopped by the trip lever **100** (figure 153).

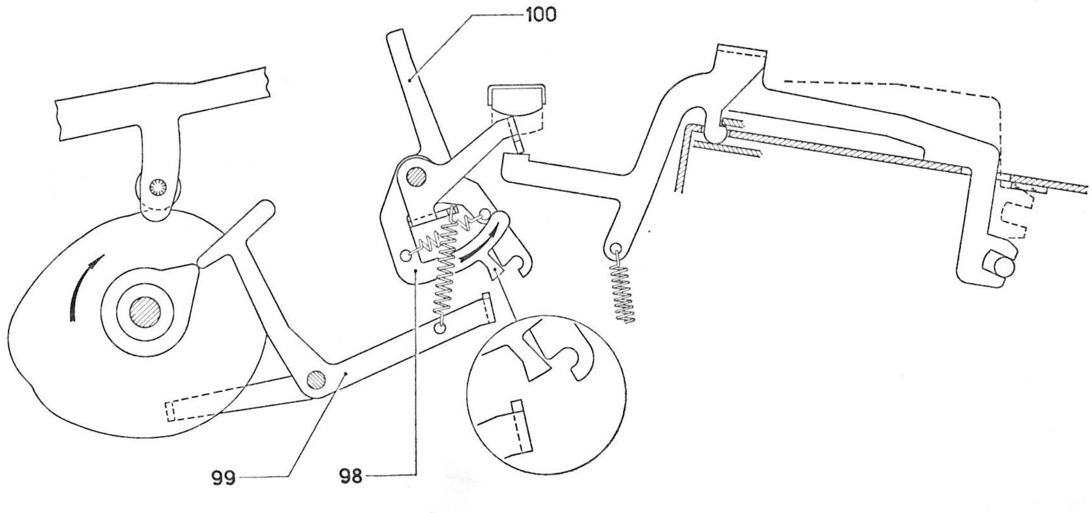
Since on a repeat operation the rotation of the backspace latch **98** is greater, it is not in position to latch the starting lever **99** in order to stop the flange.

The service cam group will rotate a second cycle, and will continue cycling until the operator releases the Backspace Key.

152



153



ADJUSTMENTS

1 - Figures 154-155-156

COMMAND MECHANISM ADJUSTMENTS

Obtain the following conditions:

— the clutch of the backspace cam must be closed;

— the machine must perform only one cycle when the backspace key is normally depressed;

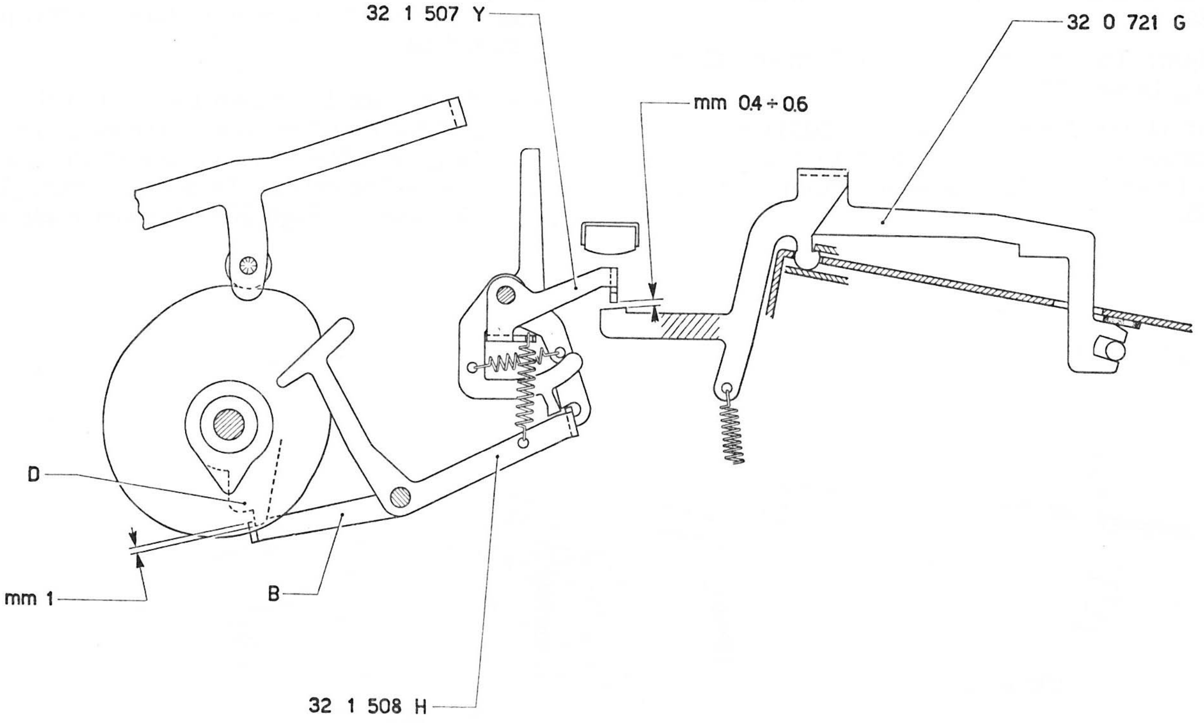
— when the backspace key is depressed all the way down repeat actions must be obtained;

— with the backspace mechanism at rest, arm **B** of the Starting Lever 32 1 508 H must have a hold of 1 mm. (.039″) on the spur of flange **D.**

To adjust: Form arm **B** of the Starting Lever 32 1 508 H.

— With the machine in the same condition, there should be a clearance of .4 to .6 mm. (.016″ to .024″) between the Trip Lever 32 1 507 Y and the rear of Lever 32 0 721 G.

154



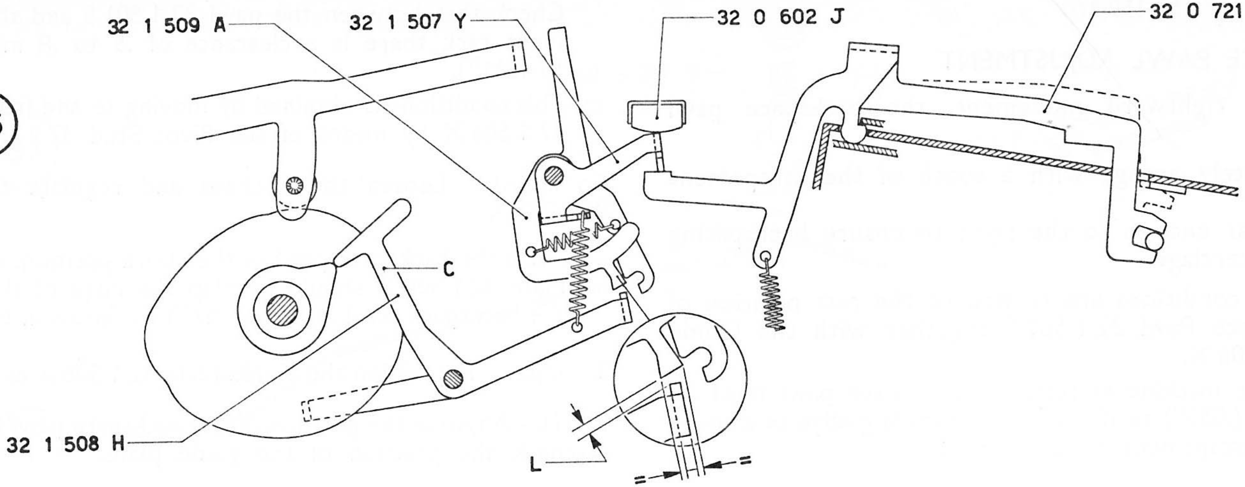
- Depress the backspace key until the Trip Lever 32 1 507 Y is in light contact with the Rubber Stop 32 0 612 J (fig. 155). Maintain the backspace key in this position and rotate the service cam until the Starting Lever 32 1 508 H is at the point of maximum restore. In this position, there should be:
  - Clearance **L** between the front of the Starting Lever 32 1 508 H and the bottom of the Trip Lever Latch 32 1 509 A.

    To adjust: To obtain this clearance form arm **C** of the Starting Lever 32 1 508 H.
- The front of the Starting Lever 32 1 508 H should be approximately centered with respect to the bottom of the Trip Lever Latch 32 1 509 A as shown in detail in figure 155.

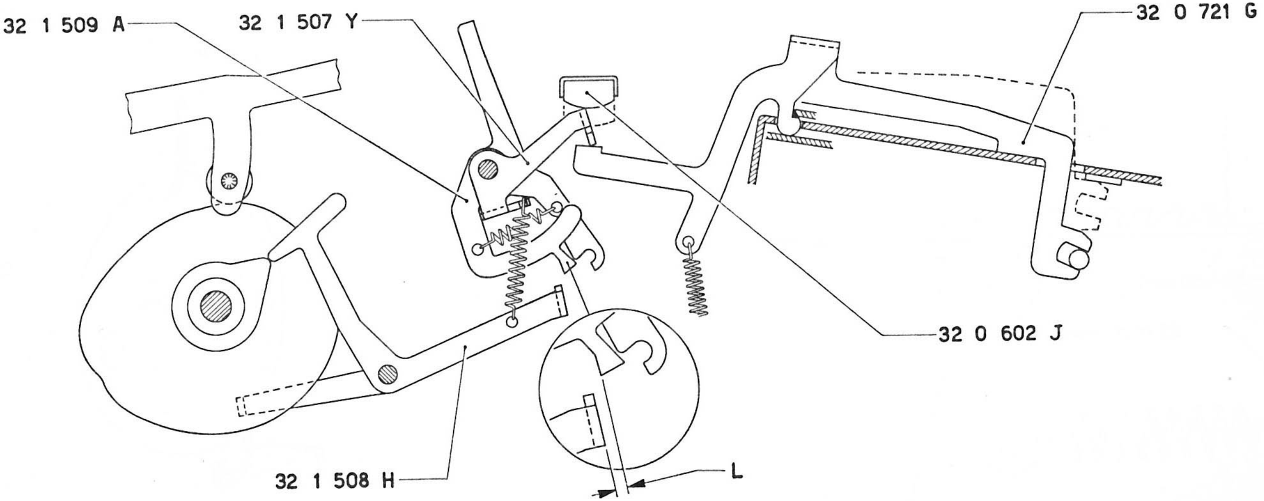
This condition will be obtained by changing the rest position of the rubber bumper 32 0 602 J.

- Complete the backspace cycle and then ***fully*** depress the backspace key so that the Trip Lever 32 1 507 Y deflects the Leaf Spring Stop 32 0 602 J.
  Maintain the backspace key in this position and rotate the service cam until the Starting Lever 32 1 508 H is at the point of maximum restore. In this position, there should be:
  - A clearance **L** between the front of the Starting Lever 32 1 508 H and the rear of the extension of Trip Lever Latch 32 1 509 A, as illustrated in figure 156.
    This will be correct if the .4 to .6 mm. (.016″ to .024″) clearance on Page 204 has been made correctly.

155


32 1 509 A
32 1 507 Y
32 0 602 J
32 0 721 G
C
32 1 508 H
L

156


32 1 509 A
32 1 507 Y
32 0 721 G
32 0 602 J
32 1 508 H
L

2 - Figures 157-158-159-160

BACKSPACE PAWL ADJUSTMENT

During its rightward movement, the backspace pawl must:

- — Immediately engage with a tooth of the escapement rack.
- — Travel far enough to the right to ensure backspacing of the carriage.

Both these conditions are related to the rest position of the Backspace Pawl 32 1 501 S together with the Guide Plate 32 1 506 X.

- — With the machine at rest, the backspace pawl must be 1.5 mm. (.059″) to the left of the leading edge of a tooth of the escapement rack, figure 158.

  Check that between the pawl 32 1 501 S and the escapement rack there is a clearance of .5 to .8 mm. (.020″ to .031″).

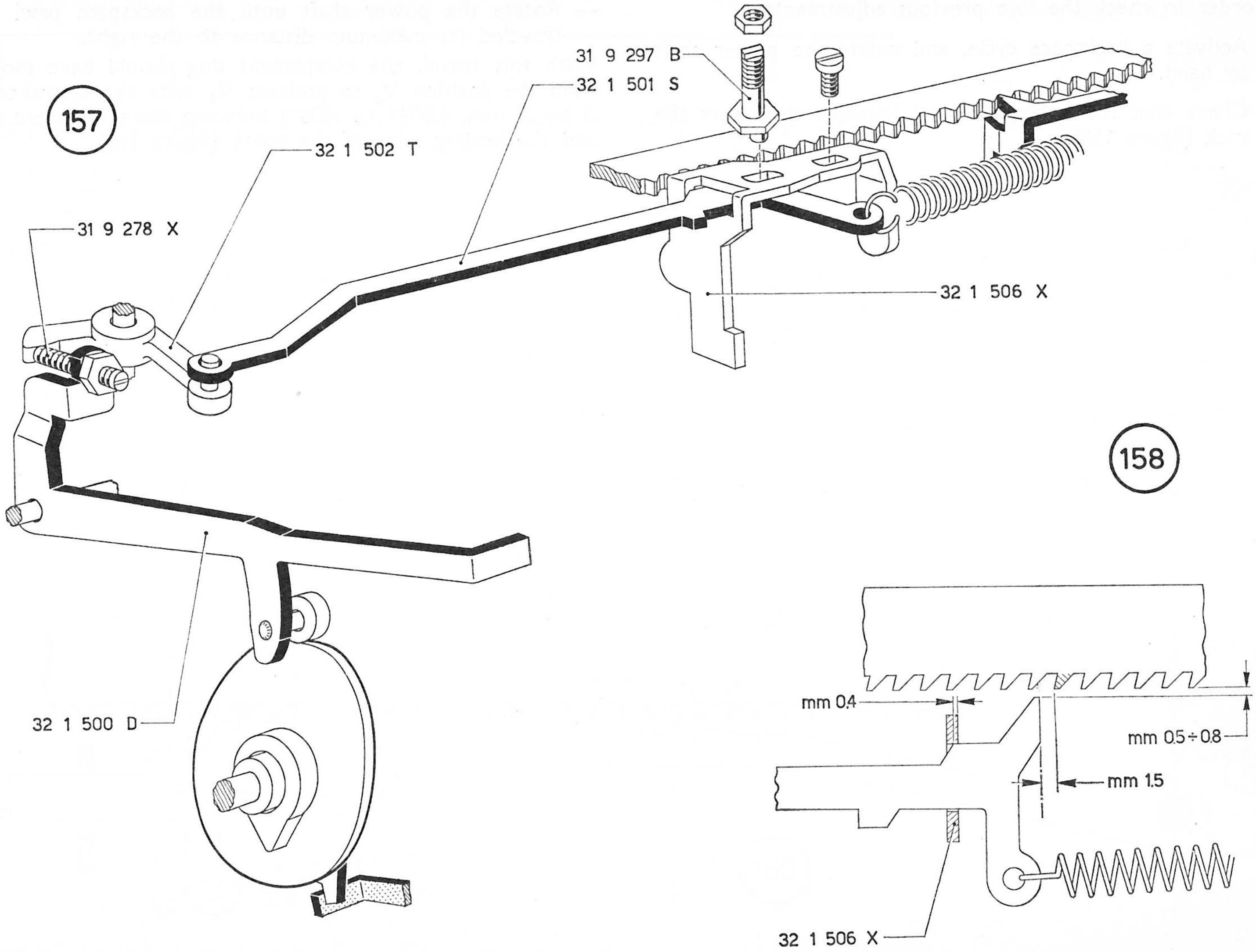
  This conditions is obtained by moving to and fro the plate 32 1 506 X by means of the Pivot Stud 32 9 297 B.

To adjust: Loosen the Locknut and regulate the screw 31 9 278 X.

- — With the backspace pawl in the above position, the Guide Plate 32 1 506 X should overlap the edge of the step of the backspace pawl .4 mm. (.016″) as shown in figure 158.

To adjust: Reposition the Guide Plate 32 1 506 X as required.

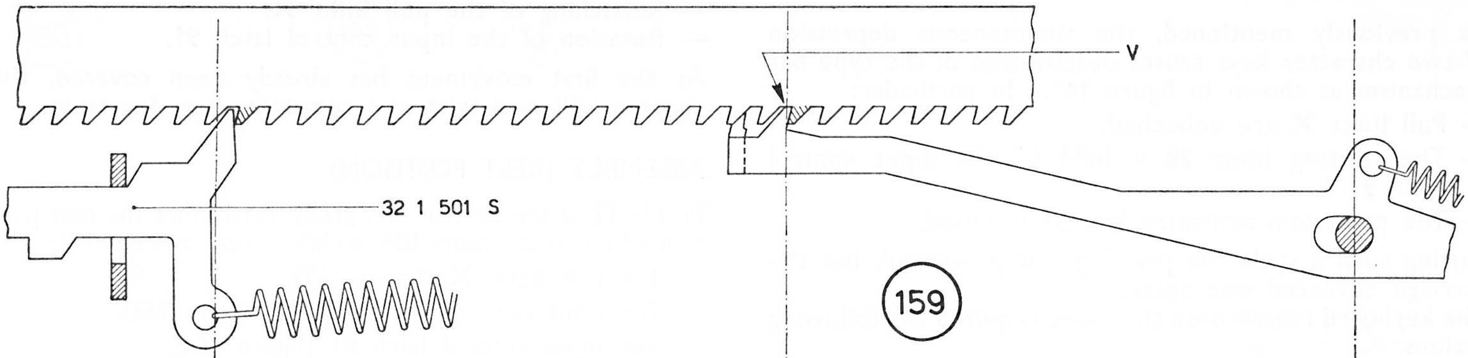
NOTE - Anytime the position of the backspace pawl is altered, re-check the position of the guide plate.


157
31 9 297 B
32 1 501 S
32 1 502 T
31 9 278 X
32 1 506 X
32 1 500 D
158
mm 0.4
mm 0.5÷0.8
mm 1.5
32 1 506 X

In order to check the two previous adjustments:

- Activate a backspace cycle, and rotate the power shaft by hand.
- Check that the backspace pawl immediately enters the rack (figure 159).
- Rotate the power shaft until the backspace pawl has traveled its maximum distance to the right.

With this travel, the escapement dog should have moved from the position V_1 to position V_2, with the clearance of .1 to .2 mm. (.004″ to .008″) between the escapement dog and the leading edge of the tooth (figure 160).



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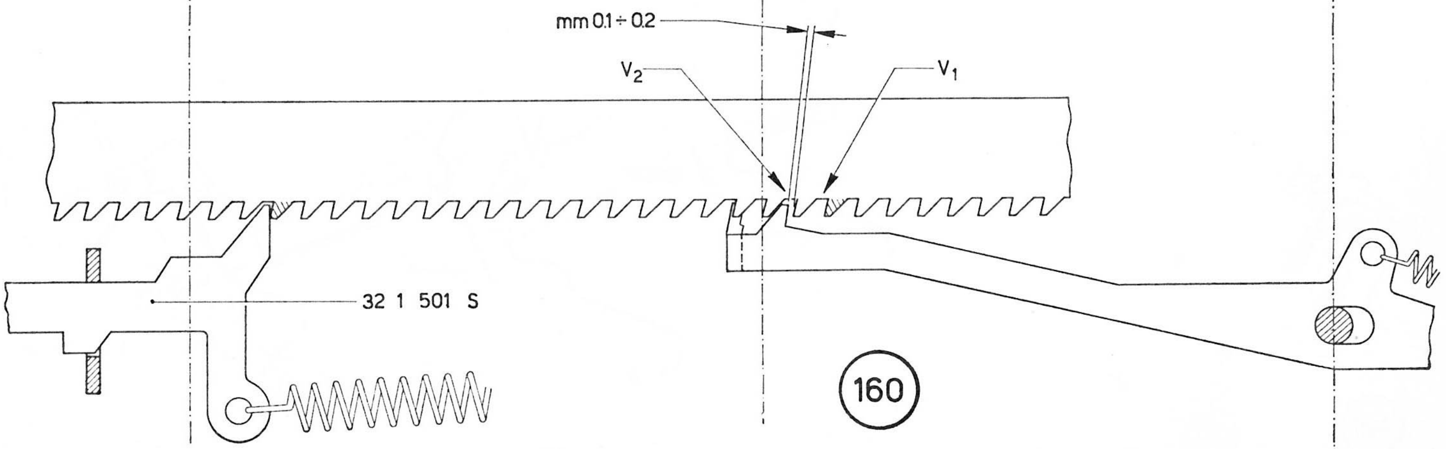


160

KEYBOARD REACTIVATION MECHANISM

As previously mentioned, the simultaneous depression of two character keys causes deactivation of the type bar mechanism as shown in figure 161. In particular:

- Pull links **X** are unlatched.
- The starting lever **28** is held by the input control latch **91**.
- The print cam activating bail **31** is raised.

During such a cycle the printing was prevented, but the carriage advanced one space.
The keyboard reactivation therefore required the following actions:

- Backspacing the carriage.
- Relatching of the pull links **X**.
- Rotation of the input control latch **91**.

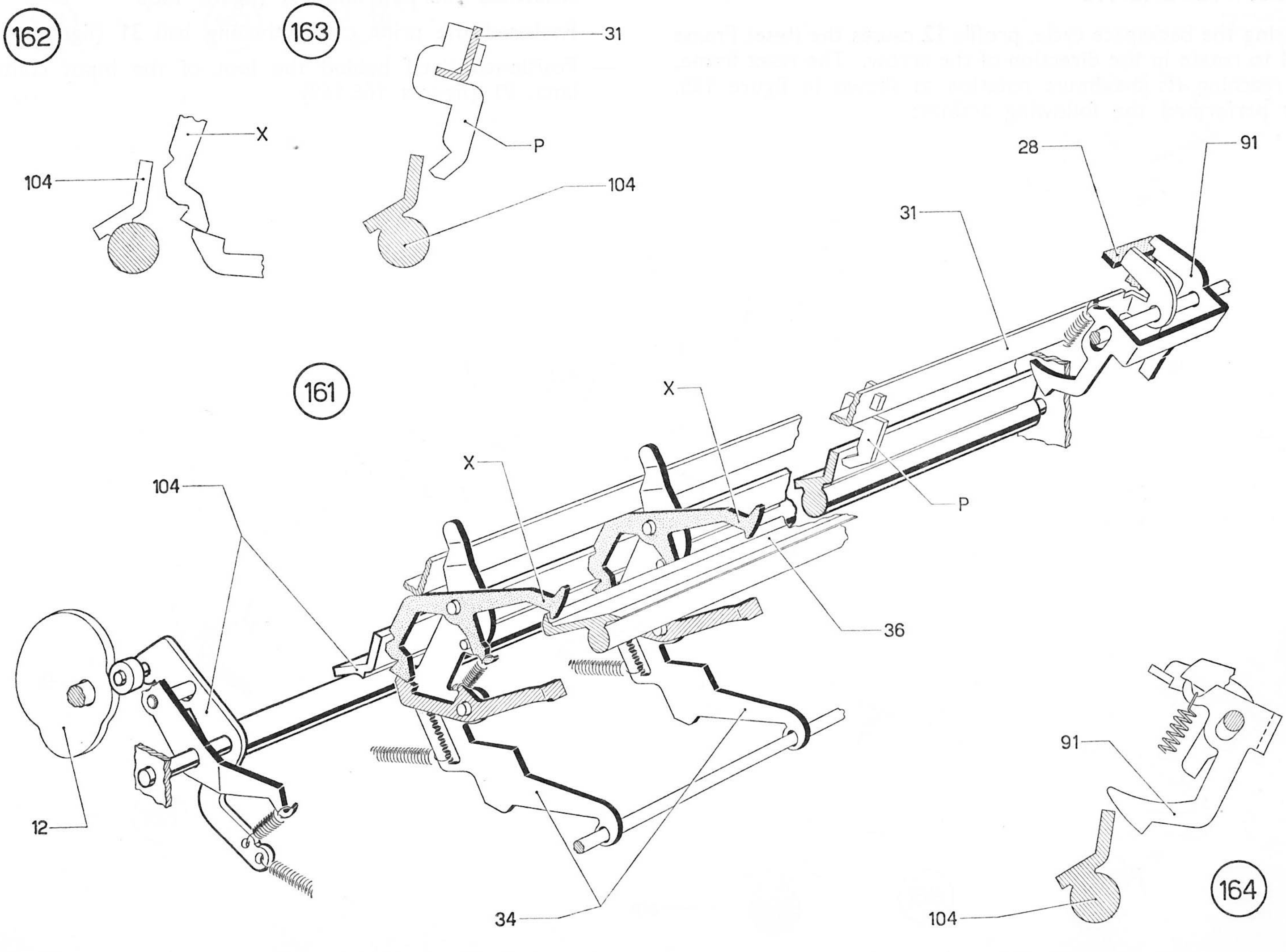
As the first movement has already been covered, this chapter will deal with the remaining two functions.

ASSEMBLY (REST POSITION)

Profile **12** of the service cam group establishes the rest position of the reset frame **104**, which in turn can control:

- The pull links **X** (figure 162).
- The print cam activating bail **31** (figure 163).
- The input control latch **91** (figure 164).

162



163

161

164

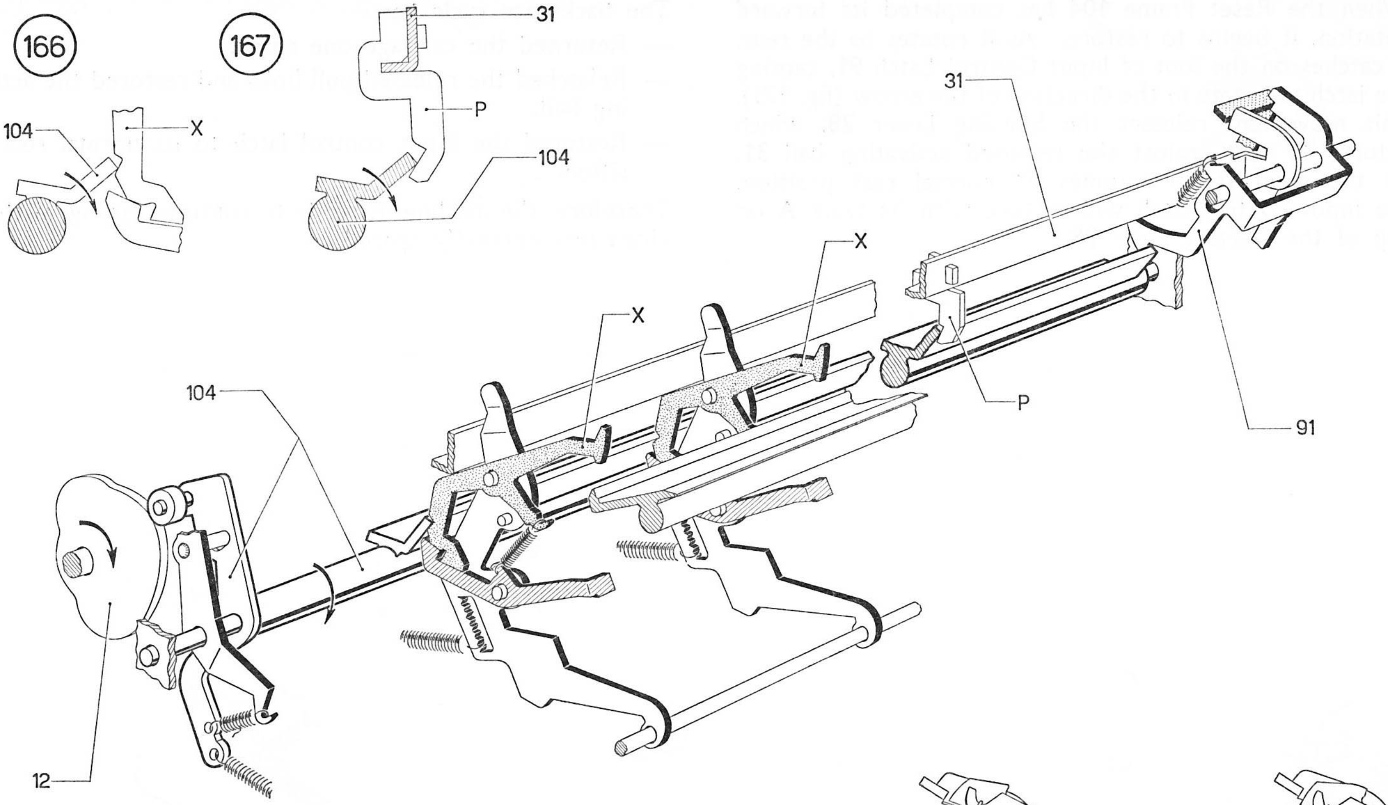
RESET MOVEMENTS

During the backspace cycle, profile **12** causes the Reset Frame **104** to rotate in the direction of the arrow. The reset frame, in reaching its maximum rotation as shown in figure 165, has performed the following actions:

— Relatched the pull links **X** (figure 166).

— Restored the print cam activating bail **31** (figure 167).

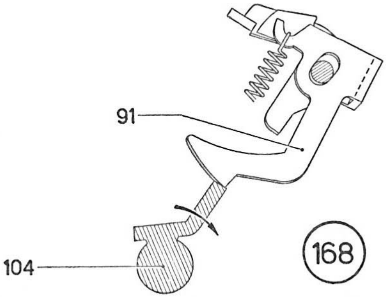
— Positioned itself behind the foot of the input control latch **91** (figures 168-169).



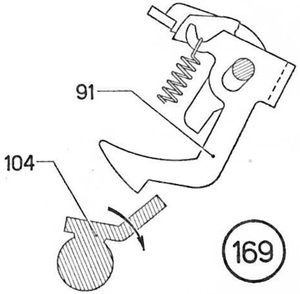
166

167

165



168



169

— When the Reset Frame **104** has completed its forward rotation, it begins to restore. As it rotates to the rear, it catches on the foot of Input Control Latch **91**, causing the latch to rotate in the direction of the arrow (fig. 171). This movement releases the Starting Lever **28**, which returns to rest against the restored activating bail **31**. As the reset frame resumes ist normal rest position, the input control latch will restore with its wing **A** on top of the starting lever **28**.

The backspace cycle has:

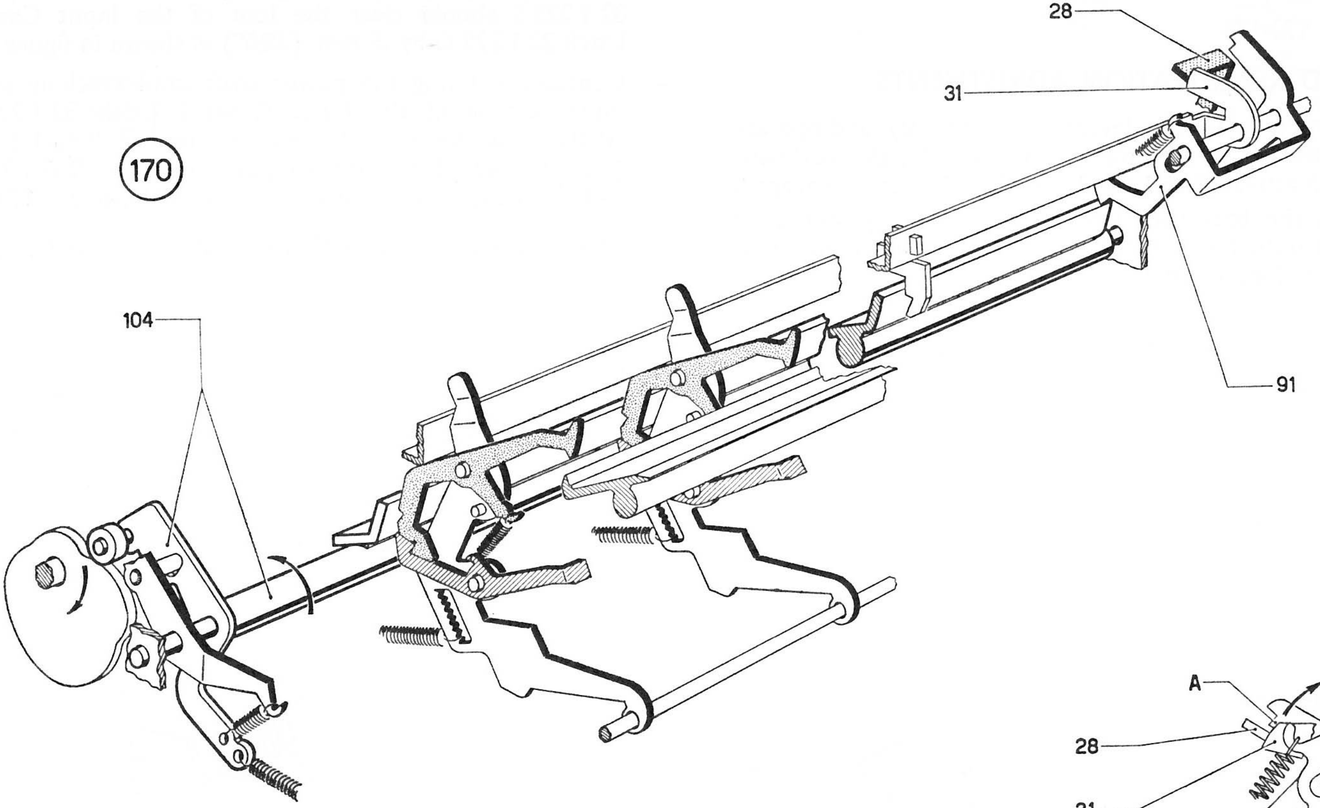
— Returned the carriage one space.

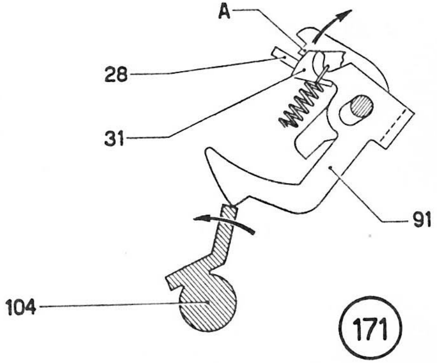
— Relatched the released pull links and restored the activating bail.

— Restored the input control latch to its normal rest position.

Therefore, the machine is ready to continue typing, with the characters correctly spaced.

170





171

ADJUSTMENTS

1 - Figures 172-173

KEYBOARD REACTIVATION ADJUSTMENTS

Depress two character key levers simultaneously, and operate the full cycle. At the completion of the cycle, the keyboard should be deactivated and the Print Cam Clutch disengaged.

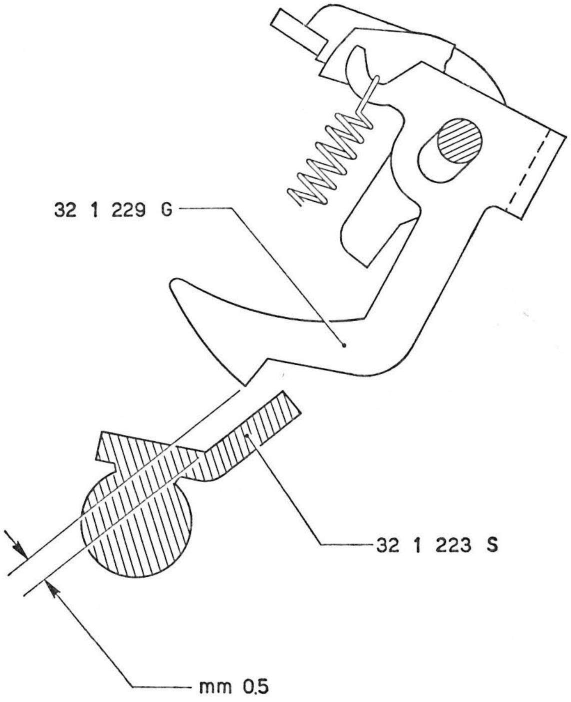
— Depress the backspace key and rotate the power shaft by hand until the Reset Frame 32 1 223 S has reached its maximum forward rotation.

In this position, the trailing edge of the Reset Frame 32 1 223 S should clear the foot of the Input Control Latch 32 1 229 G by .5 mm. (.020″) as shown in figure 172.

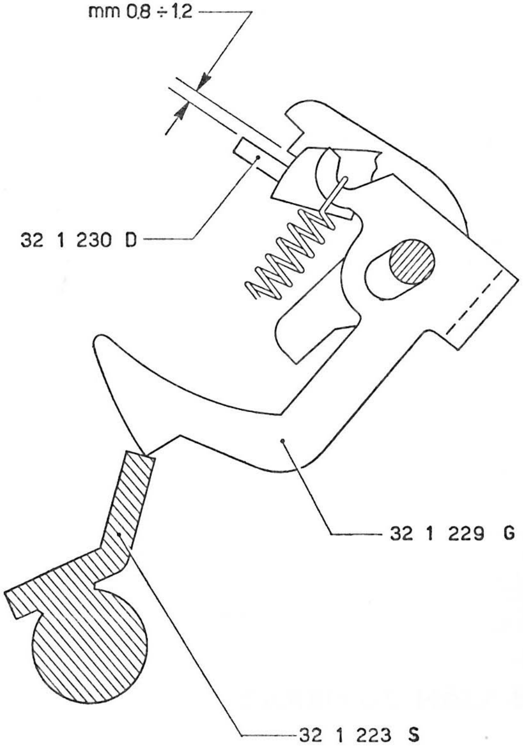
— Continue rotating the power shaft until reaching maximum restore of the Input Control Latch 32 1 229 G. At this time there should be a clearance of .8 to 1.2 mm. (.031″ to .047″) between the Input Control Latch 32 1 229 G and the wing of Starting Lever 32 1 230 D, figure 173.

To adjust: Form the Input Control Latch 32 1 229 G.

172



173



CARRIAGE HALF SPACE

FOREWORD

To facilitate the replacement of one word with another which is one character more or less, the Praxis 48 is equipped with a half space feature.
The half space mechanism allows the carriage to move a half space to the left when the key is depressed. The carriage will remain in this position as long as the key is held depressed. When the half space key is released, the carriage will move the remaining half space.

ASSEMBLY (REST POSITION)

Figure 174 indicates the machine in its normal rest position, with the escapement rack **54** held by escapement dog **55**.

The half space mechanism comprises:

- The Half Space Dog **110**.
- The Half Space Dog Control Bridge **111**.
- The connecting links **109**, **108**, **107** and **106**.
- The Half Space Key Lever **105**.

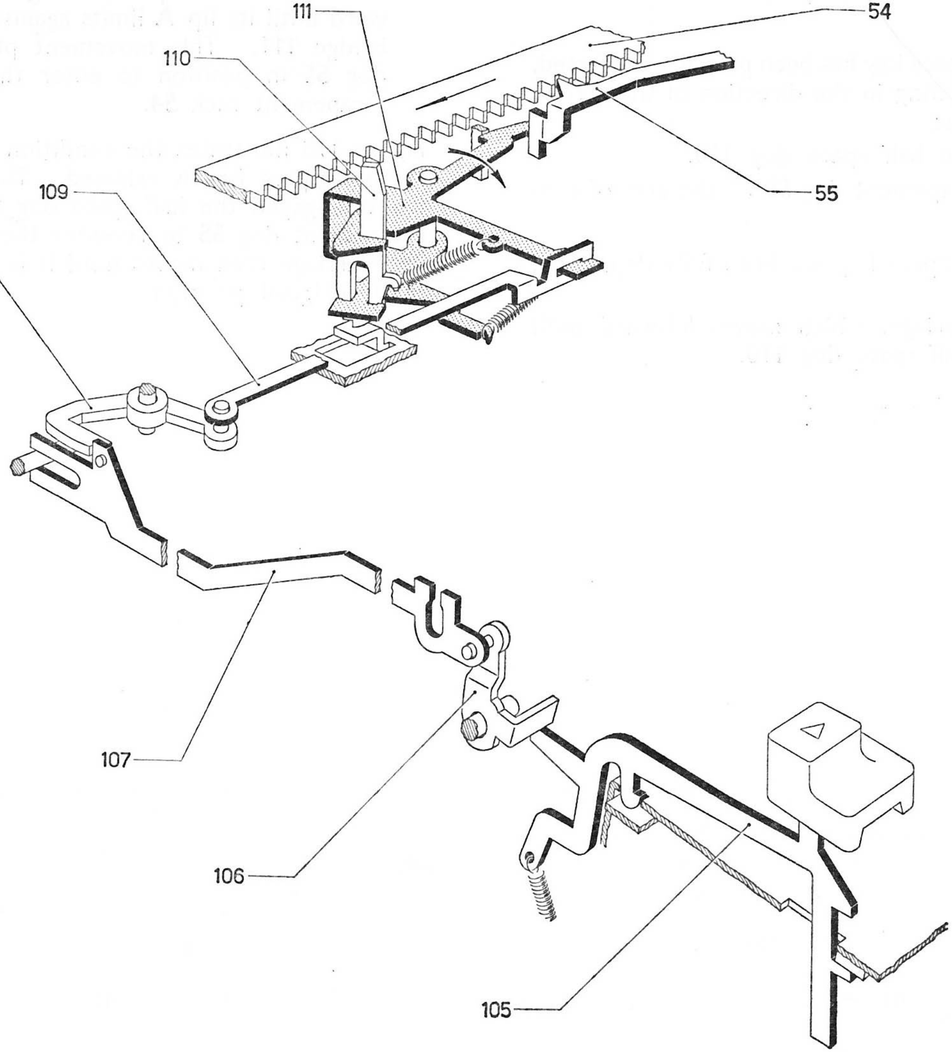
At rest, the key lever is held against the upper keyboard plate by its spring. Through the linkage of the half space mechanism, the half space dog **110** is held clear of the escapement rack.

ACTIVATION

In order to obtain the half space movement of the carriage, the following actions are necessary:

- Engage the half space dog with the escapement rack.
- Disengage the escapement dog from the escapement rack.

Depression of the half space key will cause the half space dog control bridge **111** to rotate. In doing so, the half space dog **110** is meshed with escapement rack **54**, and the escapement dog **55** is released.



174

— Figure 175 illustrates the half space device in its rest position.

— In figure 176 the half space key has been partially depressed, and the control is rotating in the direction of the arrow. This movement causes:

  — Engagement of the half space dog **110**.

  — Contact of the escapement dog **55** by the arm of control bridge **111**.

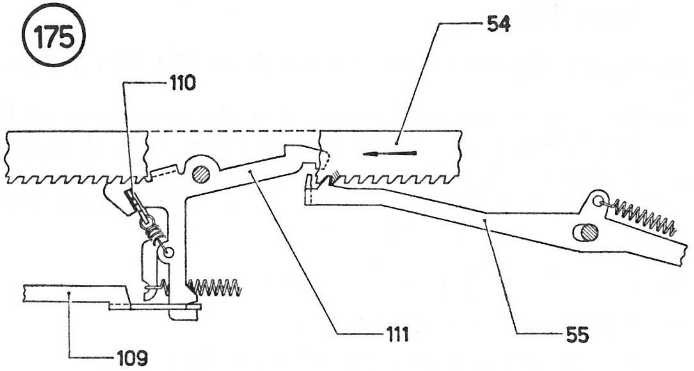
— In figure 177 the half space key has been fully depressed, resulting in:

  — Release of the carriage, which moves leftward until stopped by the half space dog **110**.

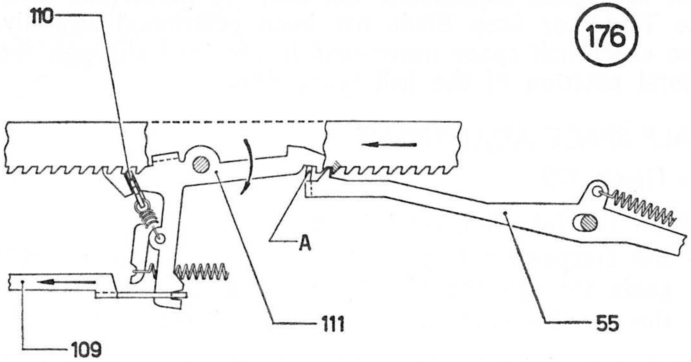
  — Release of the escapement dog **55**, which moves rightward until its lip **A** limits against lip **B** of the control bridge **111**. This movement places the escapement dog **55** in position to enter the next tooth of the escapement rack **54**.

— Figure 178 illustrates the condition of the machine after the half space key is released. The control bridge **111** has disengaged the half space dog **110**, and allowed the escapement dog **55** to re-enter the rack **54**.
The carriage then moves until it is one space to the left of its original position.

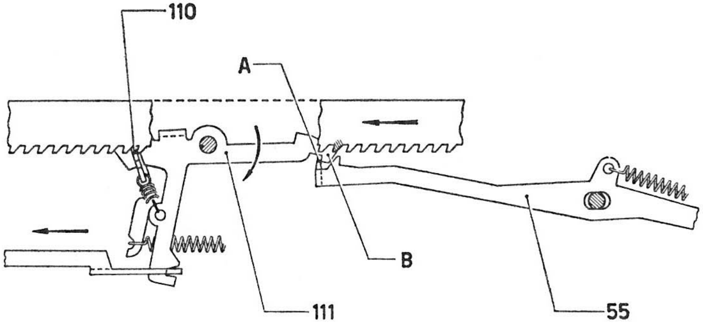
⑰⑤



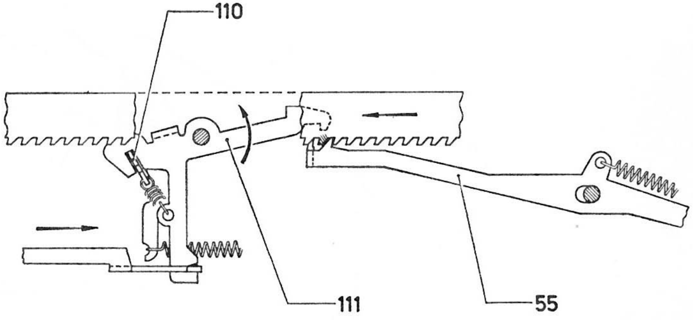
⑰⑥



⑰⑦



⑰⑧



ADJUSTMENTS

The half space adjustment can only be performed after the Tabulator Stop Blade has been positioned laterally. The exact half space movement is obtained through the lateral position of the half space dog.

HALF SPACE ADJUSTMENT

1 - Figure 179

Obtain the following conditions:

— the Escapement Dog must always control the movable guide through the Half Space Dog;

— the movable guide must move by half space.

The first condition is obtained by adjusting the angular position of the Pivot Stud 31 9 296 A so that the complete depression of the Half Space Key removes the Escapement Dog from the rack by .3 to .5 mm. (.012″ to .020″).

— When at rest the Half Space Bridge 32 1 515 P must be against the stop **K**. In this position, there should be a maximum clearance of .2 mm. (.008″) between Crank 32 1 511 K, and the Link 32 1 510 W as illustrated in figure 179.

To adjust: Open or close the slot **A** on Link 32 1 510 W.

— This adjustment will ensure that the movement of Link 32 1 510 W is limited by shaft **B** when the half space key is depressed. Consequently, preventing extension **H** of the Half Space Key Lever 32 0 652 K from hitting against the keyboard housing.

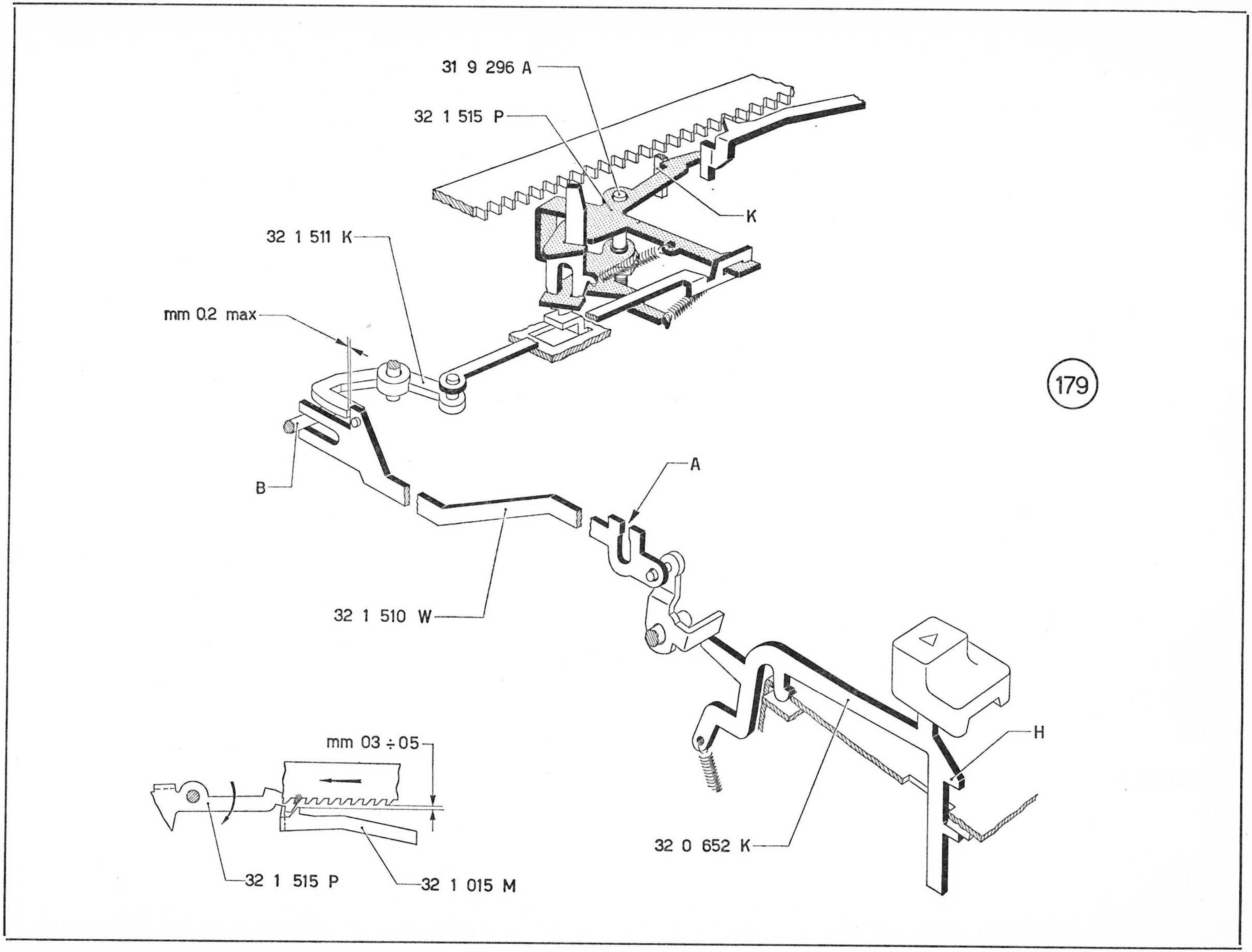
To check the half space movement:

— Type two consecutive zeros.

— Backspace twice to align with the first zero.

— Type a third zero with the half space key depressed.
The third zero should overlap the original two zeros equally.

To adjust: Move the Pivot Stud 31 9 296 A laterally until the above condition is obtained.

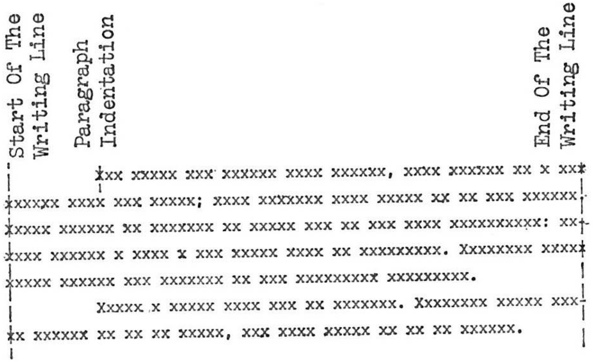

31 9 296 A
32 1 515 P
K
32 1 511 K
mm 0.2 max
B
A
32 1 510 W
H
32 0 652 K
mm 03 ÷ 05
32 1 515 P
32 1 015 M

179

MARGINS

FOREWORD

The following indicates the marginal points of typewritten work and their common terminology.



These points are:

- — Start of the writing line, or left margin.
- — Paragraph indentation.
- — End of the writing line, or right margin.

The position of these points is determined through the margin stops, their positions being controlled by a margin rack.

The left margin stop establishes:

- — The start of the writing line.
- — Paragraph indentation in conjunction with an additional command.

The right margin stop controls:

- — The bell, used to alert the operator that the end of the writing is approaching.
- — The end of the writing line by preventing printing through the line lock.

When needed, either margin can be by-passed through the use of the margin release key without altering the position of the margin stops.

The maximum carriage movement is limited by the carriage limit stops.

ASSEMBLY (REST POSITION)

- — The Margin Rack **114** is assembled and pinned on the carriage. The margin rack supports and maintains the Margin Stops **113** and **115** in position.
- — Margin stop assemblies, illustrated in figures 181 and 182.

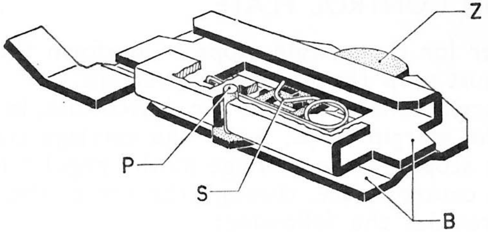
The individual parts which compose a margin stop are:

- — The margin housing and guide **B**.
- — The margin plate **Z**, and pin **P** of which locks the margin stop in position.
- — The spring **S**.
- — Carriage limit stops **112** **S** and **D**.

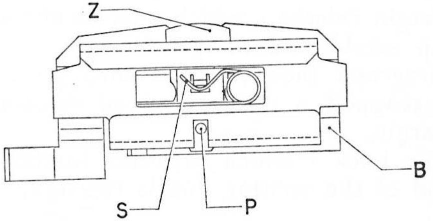
To reposition either margin stop requires:

- — Disengagement of pin **P** from the margin rack.
- — Relocation of the margin stop assembly.
- — Re-engagement of pin **P** in the margin rack.

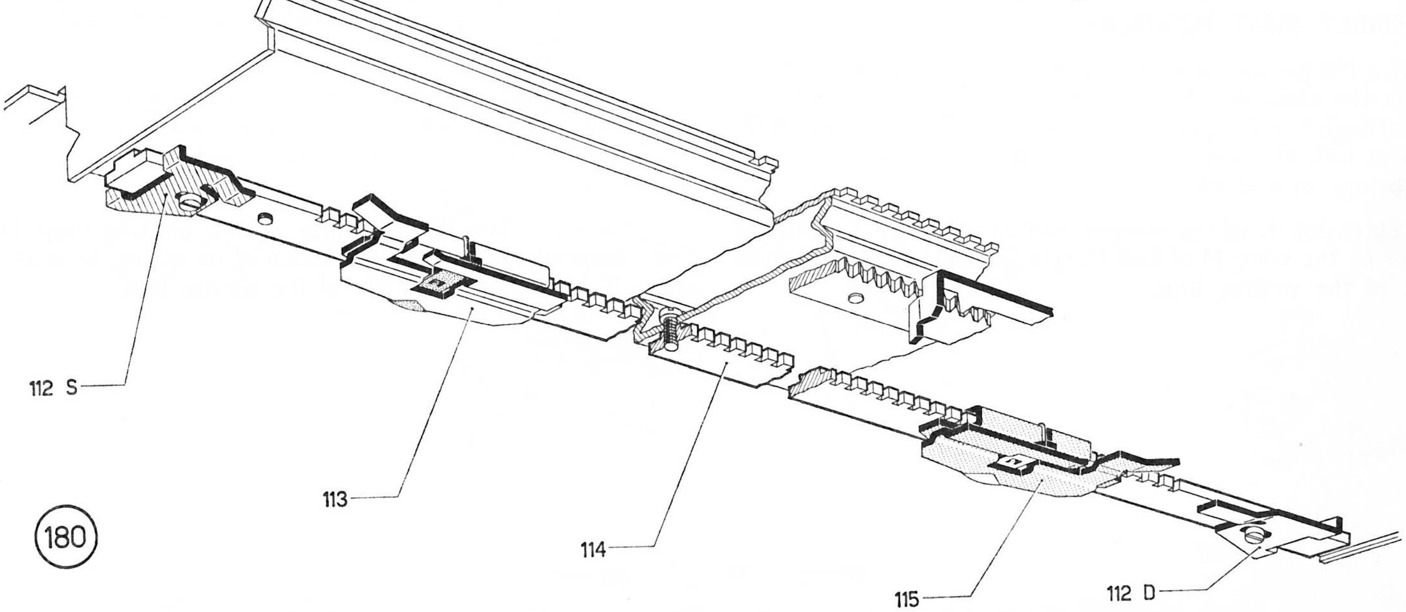
(181)



(182)



(180)



MARGIN CONTROL PLATE

In order for the margin stops to perform their function, they must stop the carriage movement.
The margin control plate is the device that, in conjunction with the margin stops, limits the carriage travel.
Besides stopping the carriage at the regular margins, the margin control plate, through the use of the appropriate key, provides the following:

- Margin release - which enables the carriage to by-pass the established margin.
- Paragraph indentation - through which the carriage is stopped a predetermined distance before the left margin.
- Line Lock - which prevents further typing when the end of the writing line is reached.

ASSEMBLY (REST POSITION)

- The Margin Control Plate **119** is mounted and can pivot on the shaft **A**. Its angular rest position is established through the Margin Control Bridge **118**, by the link **117**. The link **117** detents on shaft **B** through the action of springs **m** and m_1.

The extension **K** of the margin control plate **119**, when contacted by the wing **M** of Left Margin Stop **113**, establishes the start of the writing line.

When extension **H** is contacted by wing **N** of Right Margin Stop **115**, the end of the writing line is reached.

LEFT MARGIN - BANKING POSITION

The return of the carriage to the left margin stop is known as banking, when limited by the left margin the carriage is at the banked position.
Banking can be accomplished:

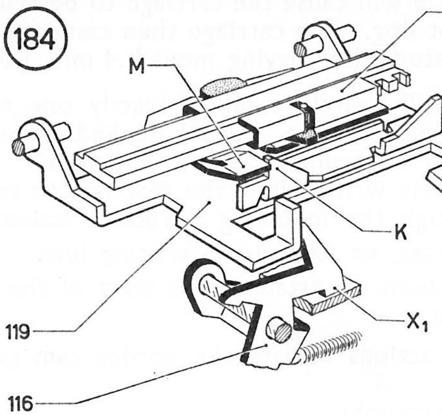
- Manually.
- Electrically.

- Return of the carriage will cause wing **M** of the left margin stop **113** to contact and move rightward the margin control plate **119**.
  The carriage movement is stopped when the projection X_1 of Banking Stop **116** contacts the plate of the service unit, figure 184.

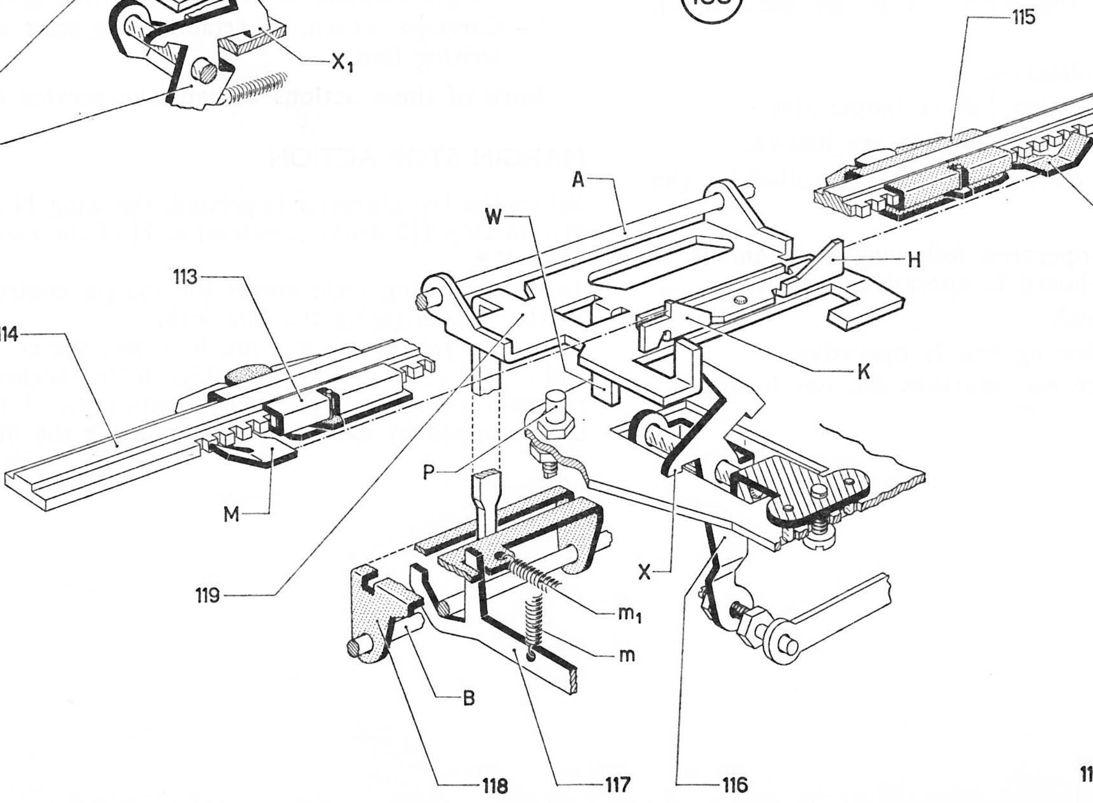
- The rightward movement of the margin control plate **119**, through the banking stop **116**, actuates the air cylinder mechanism. This will be discussed in detail in a later section.

  NOTE - The rest position of the banking stop **116** is determined through the action of its spring, by extension **X** resting on the plate of the service unit.

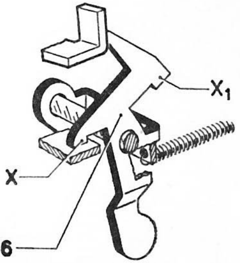
184


113
M
K
X₁
119
116

183


115
N
A
W
H
113
114
K
P
M
119
X
m₁
m
B
118
117
116

185


X₁
X
116

RIGHT MARGIN - LINE LOCK

The end of the writing line is determined by the right margin stop, which, during the last printing or spacing cycle, locks the type action bail. This action will prevent further printing, but will not deactivate the keyboard. The condition of the keyboard can differ, depending on the type of cycle which is next activated.

Depression of a character key, following engagement of the line lock, causes the keyboard to be deactivated, because:

— The pull link is unlatched.
— The print cam activating bail is inoperative.
— The print and space cam clutches are locked.

In this condition the carriage is still controlled by the escapement dog.

If a spacing cycle is operated following engagement of the line lock, the keyboard is operative, because:

— A pull link is latched.
— The print cam activating bail is operative.
— The print and space cam clutches are not locked.

Any additional cycle will cause the carriage to be released by the escapement dog. The carriage then comes to rest against the limit stud, after having moved .4 mm. (.016″).

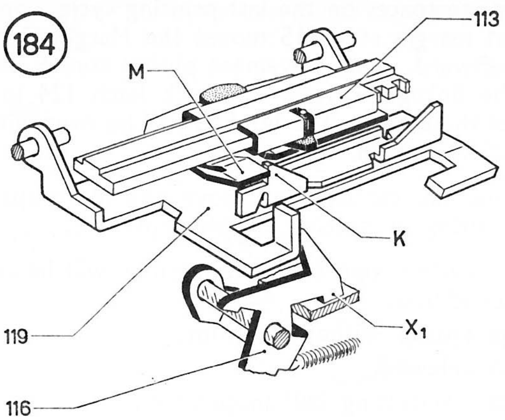
— The carriage will therefore move exactly one space, or one space plus .4 mm. (.016″) depending on the cycles following engagement of the line lock.
At the end of the writing line, the reactivation can be obtained through the following keyboard actions:
  — Margin release, to extend the writing line.
  — Carriage return, to establish the start of the next writing line.

Both of these actions actuate the service cam group.

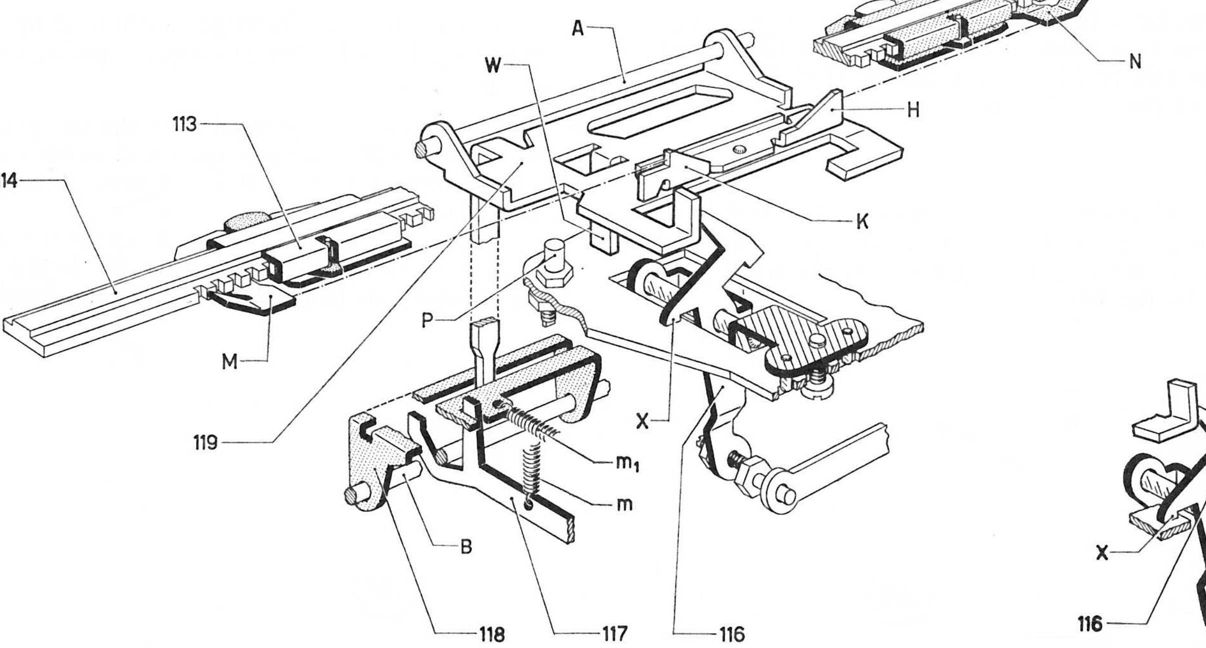
MARGIN STOP ACTION

Before the last character is printed, the wing **N** of the right margin stop **115** contacts extension **H** of the margin control plate **119**.
The last printing cycle moves the margin control slide **119** to the left, engaging the line lock.
The next cycle does not print, however, the carriage spaces and is held by the escapement dog. If the escapement dog is released at this time, the carriage will move .4 mm. (.016″) until stopped by extension **W** contacting the limit stud **P**.

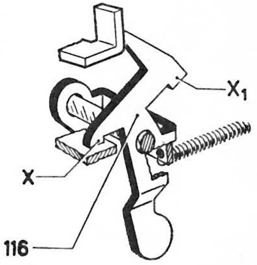
184


113
M
K
119
X₁
116

183


115
A
W
N
H
113
114
K
P
M
119
m₁
X
m
B
118
117
116

185


X₁
X
116

LINE LOCK

As already covered, the line lock is engaged one space before the carriage limits at the right margin stop.
When engaged, the line lock prevents rotation of the type action bail.

ASSEMBLY (REST POSITION)

— Stud **T** of the Line Lock Latch **124**, resting on surface **K** of the sidewall opening, establishes the rest position of the line lock mechanism.
In this position, the hook of the line lock latch is clear of the path of wing **A** of the Type Action Bail Arm **27**, as shown in figure 187.

— The line lock latch **124**, through the action of its spring, holds the line lock linkage **123**, **122**, **121** and **120** at rest position. In this position, the eccentric stud **E** will just clear lip **S** of the margin control plate **119**.

ACTIVATION

When the line lock is engaged, hook **B** of the line lock latch **124** must be in the path of wing **A** of the type action bail arm **27**. This is achieved by moving the margin control plate **119** one space to the left.

— As the carriage spaces on the last printing cycle, wing **N** of the right margin stop **115** moves the Margin Control Plate **119** leftward. This movement pushes stud **E**, which through the linkage, rotates line lock latch **124** in the direction of the arrow. The hook **B** will be over wing **A** of type action bail **36**, figure 188.

— At this time, the carriage can move one more space if either a printing or spacing cycle is operated.

— If a printing cycle is operated, the machine will be in the following condition:

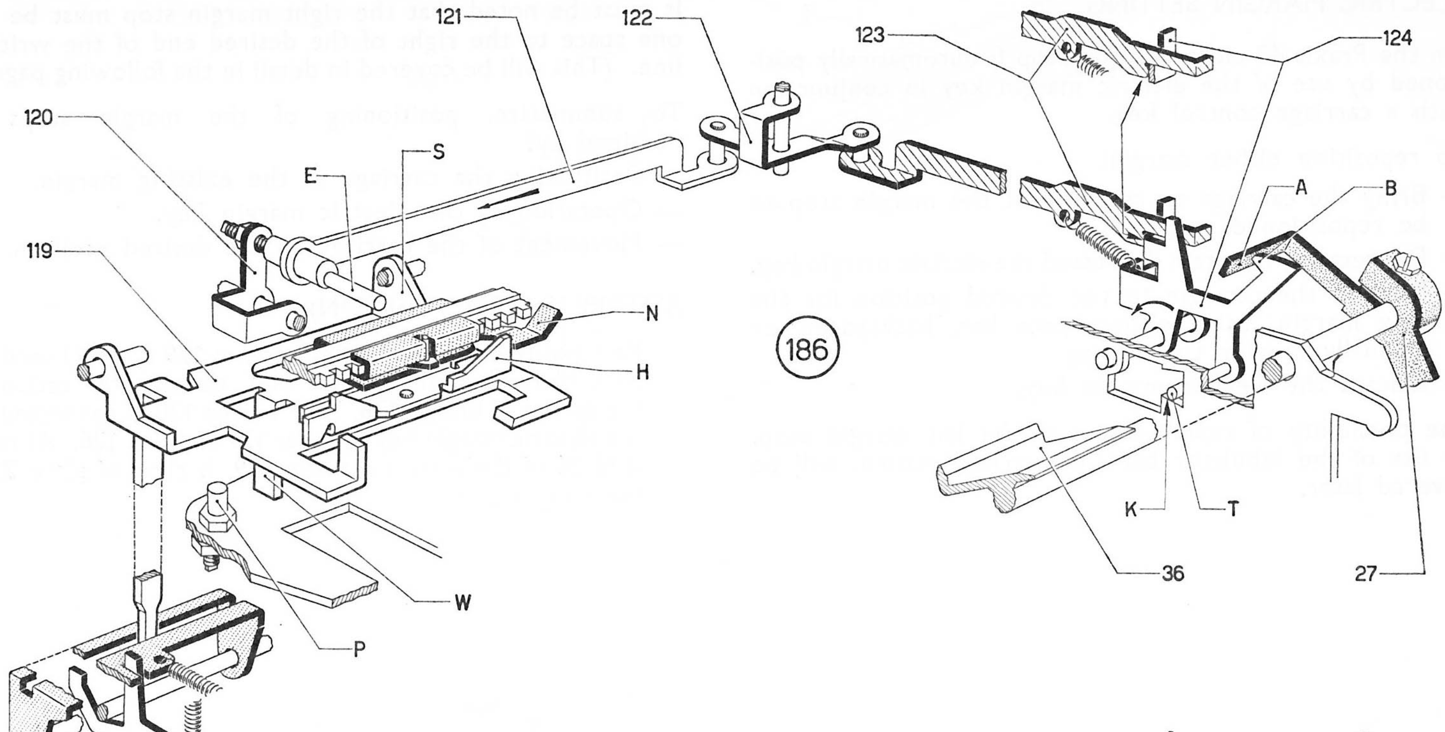
— Carriage spaced without printing.

— Pull link released.

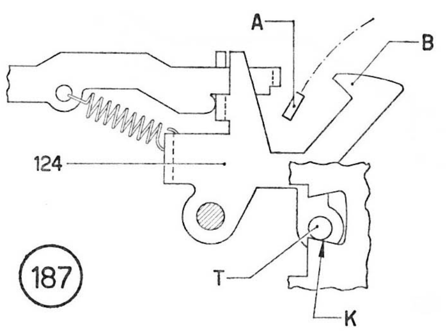
— Print cam activating bail inoperative.

In this condition, the carriage is still held by the escapement dog, but a further printing or spacing cycle can not be operated.

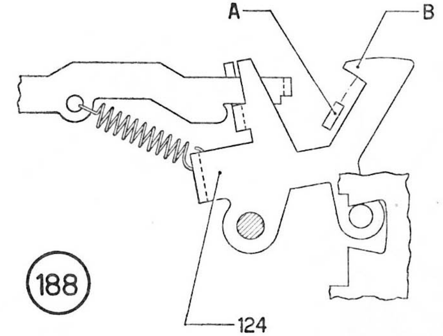
— If a spacing cycle is operated after the last printing cycle, the carriage will move one space and extension **W** of the margin control plate will be .4 mm. (.016″) from the limit stud **P**.
Operation of another cycle will cause the carriage to move until stopped by limit stud **P**. In this condition, the carriage is no longer controlled by the escapement dog.



186



187



188

ELECTRIC MARGIN SETTING

On the Praxis 48 either margin stop is automatically positioned by use of the electric margin key in conjunction with a carriage control key.

To reposition either margin:

- Bring the carriage to rest against the margin stop to be repositioned.
- Depress and maintain depressed the electric margin key.
- Position the carriage to the desired position for the new margin, using either space bar, backspacer, or manually moving the carriage.
- Release the electric margin key.

The possibility of rapid setting of the left margin stop, by use of the tabulator bar and carriage return, will be covered later.

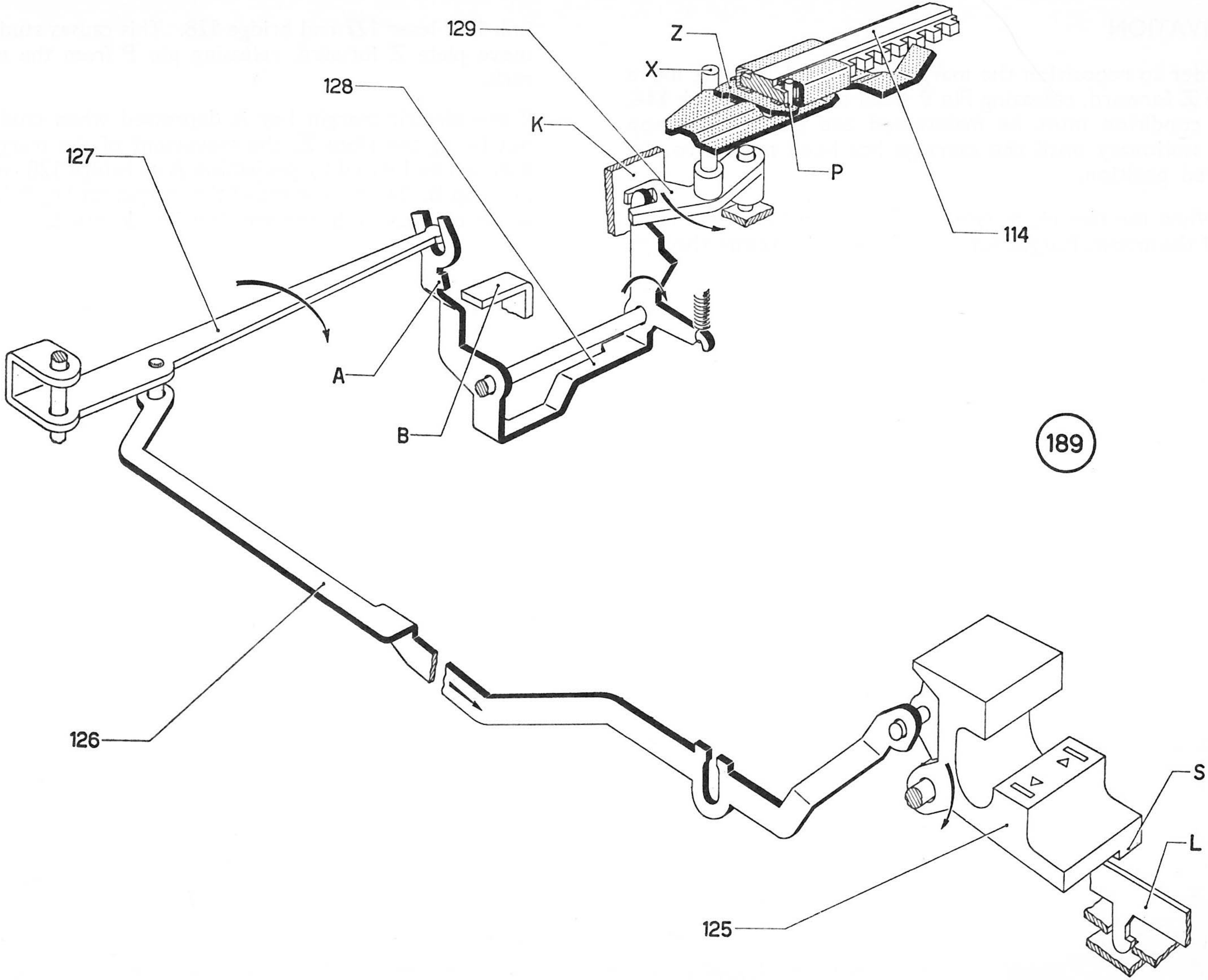
It must be noted that the right margin stop must be set one space to the right of the desired end of the writing line. (This will be covered in detail in the following pages).

To summarize, positioning of the margin stops is obtained by:

- Positioning the carriage at the existing margin.
- Operation of the electric margin key.
- Movement of the carriage to the desired position.

ASSEMBLY (REST POSITION)

- Rest position of the Margin Set Arm **129** is established by back plate K of the service unit, through the action of the spring of bridge **128**. The bridge **128** is connected to the electric margin key by lever **127** and link **126**. At rest, stud X of the margin set arm **129**, is clear of plate Z of the margin stop.



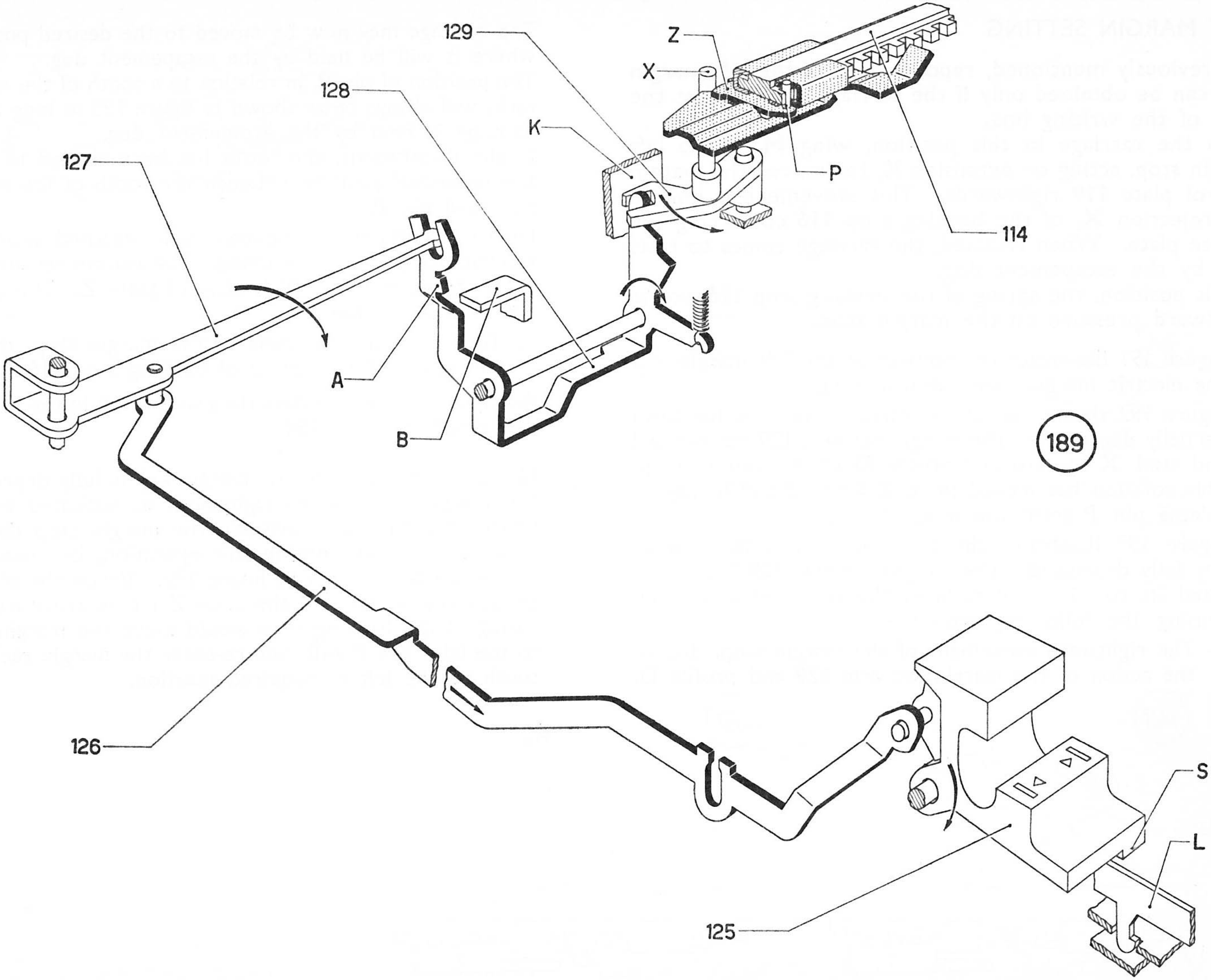
189

ACTIVATION

In order to reposition the margin stop, stud X must move Plate Z forward, releasing Pin P from the Margin Rack 114. This condition must be maintained and the margin stop held stationary until the carriage has been moved to the desired position.

— When the electric margin key is rotated in the direction of the arrow, Margin Set Arm **129** will also rotate through link **126**, lever **127** and bridge **128**. This causes stud **X** to move plate **Z** forward, releasing pin **P** from the margin rack.

— If the electric margin key is depressed when stud **X** is not facing the plate **Z**, the movement of the margin set arm will be limited by projection **A** of bridge **128** contacting stop **B**. The movement of the margin set key is limited when protrusion **S** contacts the key levers **L**.


129
Z
X
128
K
127
P
114
A
B
189
126
S
L
125

LEFT MARGIN SETTING

As previously mentioned, repositioning of the left margin stop can be obtained only if the carriage is located at the start of the writing line.
With the carriage in this position, wing M of the left margin stop, acting on extension K, has moved the margin control plate 119 rightwards. This movement is limited by projection X_1 of the banking stop 116 contacting the service plate. When released, the carriage comes to rest, held by the escapement dog.
In this position, the spring of the banking stop 116 exerts a leftward pressure on the margin stop.

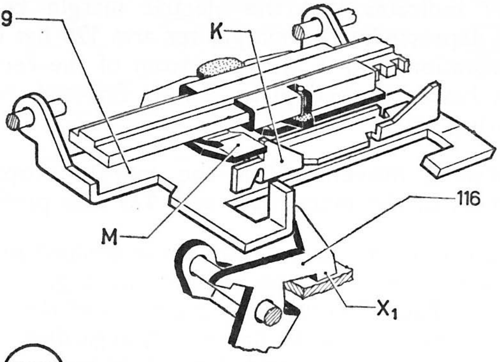
- Figure 191 illustrates the carriage at the left margin and the electric margin mechanism at rest.
- Figure 192 shows that the electric margin key has been partially depressed. The margin set arm **129** has rotated and stud **X** has reached profile **D** of the margin stop. This rotation has moved plate **Z** forward sufficiently to release pin **P** from the margin rack.
- Figure 193 illustrates the mechanism with the margin key fully depressed. The margin set arm **129** has completed its rotation and rests in the recess of profile **D**, causing the following action:
  - The rightward movement of the margin stop, due to the action of the margin set arm **129** and profile **D**.

The carriage may now be moved to the desired position, where it will be held by the escapement dog.
The position of pin **P**, in relation to a tooth of the margin rack, will always be as shown in figure 193 as long as the carriage is held by the escapement dog.
In the illustrations, the tooth has been shaded to show the reciprocal position between the tooth of the margin rack and pin **P**.

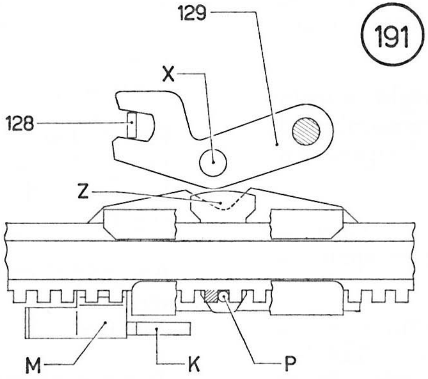
- Figure 194 illustrates the conditions reached when the electric margin key is released. The margin set arm **129** has restored and stud **X** is clear of plate **Z**. This allows the following action:
  - The leftward movement of the margin stop, due to the action of the spring of banking stop **116**.

As a result, pin **P** re-enters the margin rack in the position illustrated in figure 194.

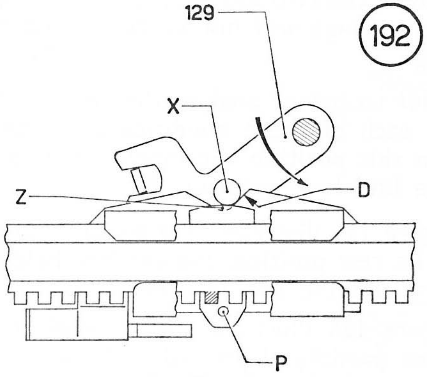
NOTE - When the electric margin key is fully depressed, the margin stop moves rightward, as indicated by the figures 192 and 193. Assume the margin stop did not move to the right during this operation, but remained in the position shown in figure 192. When the electric margin key is released, the plate **Z** moves rearward, the spring of the banking stop would move the margin stop to the left. Pin **P** will then re-enter the margin rack one tooth to the left of required position.



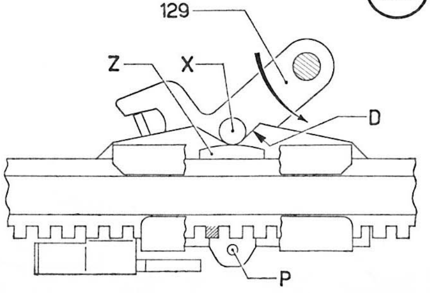
190



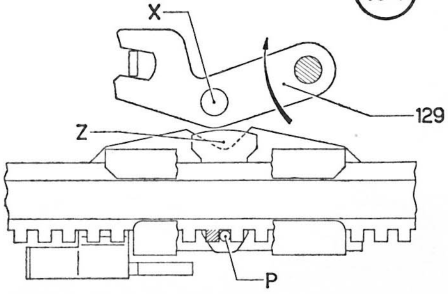
191



192



193



194

RIGHT MARGIN SETTING

As already mentioned, when repositioning the right margin stop, it is necessary to position the carriage at the right margin. In this position, the machine will be in either of the following conditions:

— The carriage will be held by the escapement dog, having moved two spaces after printing the last character.

— The carriage will be stopped by the limit stud, having moved the two spaces, plus .4 mm (.016″). In this case the carriage will not be controlled by the escapement dog.

In order to better analyze the setting of the right margin under each of these conditions, it must be remembered that in this position the margin stop is pushed rightward by the line lock mechanism.

— Figure 195 illustrates the electric margin key mechanism in its rest position, the carriage held by the escapement dog, and the line lock engaged.

— Figure 196 illustrates that the electric margin key has been partially depressed. The margin set arm **129** has just reached profile D of the right margin stop. With this movement, the plate Z has been pushed forward sufficiently to release pin P from the margin rack.

— Figure 197 indicates that the electric margin key has been fully depressed. The margin set arm **129** has completed its rotation, and is at the bottom of the recess of profile D, having pushed plate Z fully forward, causing the following action:

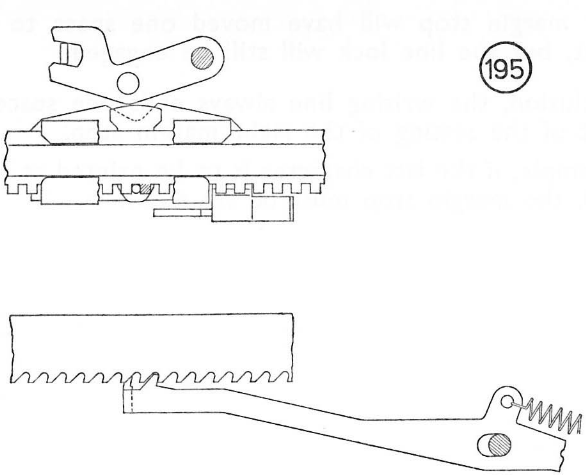
The rightward movement of the margin stop, due to the action of the margin set arm 129 and profile D.

The carriage can now be moved to the desired position where it will be held by the escapement dog.
The position of pin P in relation to a tooth of the margin rack will be the same as in figure 197, regardless of the position of the carriage, provided it is held by the escapement dog.

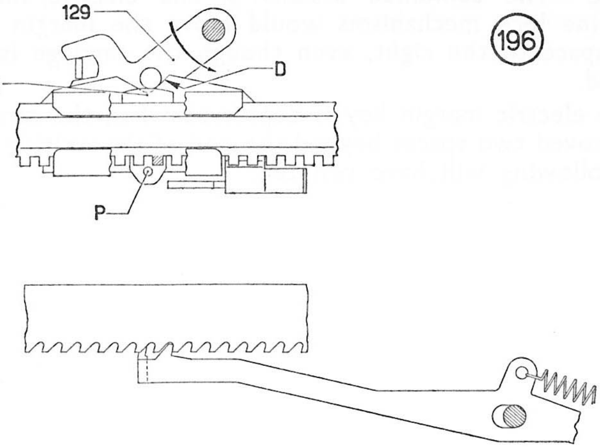
— Figure 198 illustrates the mechanism after the electric margin key has been released. The margin set arm **129** has restored and stud X is clear of plate Z. This allows the following action:

An additional rightward movement of the margin stop due to the pressure exerted by the line lock mechanism.

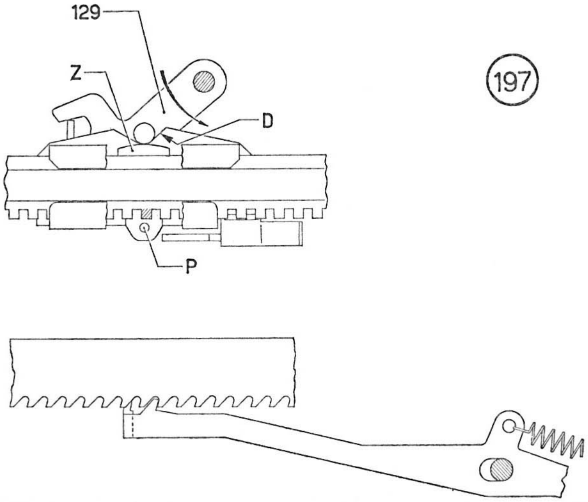
This movement results in the pin P re-entering the margin rack one tooth to the right of the carriage position, as illustrated in figure 198.



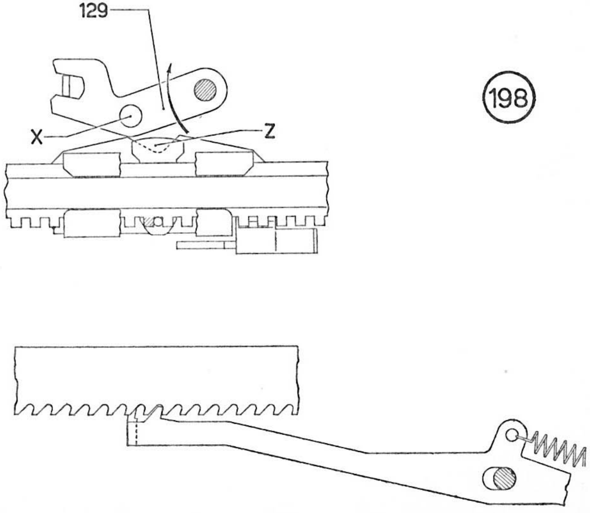
195



196



197



198

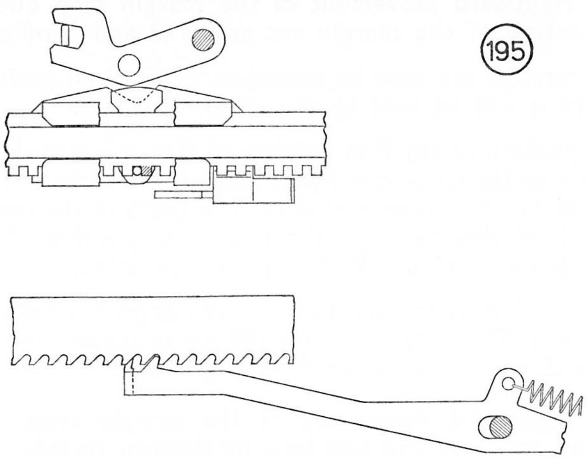
NOTE - The combined actions of the electric margin and line lock mechanisms would move the margin stop one space to the right, even though the carriage is not moved.

If the electric margin key is depressed when the carriage has moved two spaces beyond the end of the writing line, the following will have resulted:

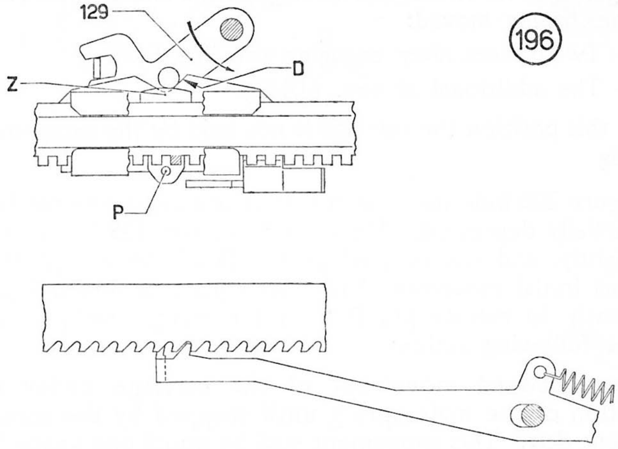
— The margin stop will have moved one space to the right, but the line lock will still be engaged.

In conclusion, the writing line always ends one space to the left of the setting of the right margin stop.

For example, if the last character is to be printed at position 80, the margin stop must be set at 81.



(195)



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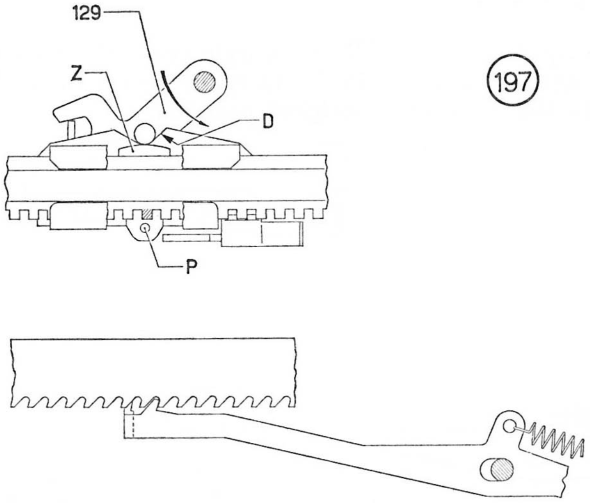
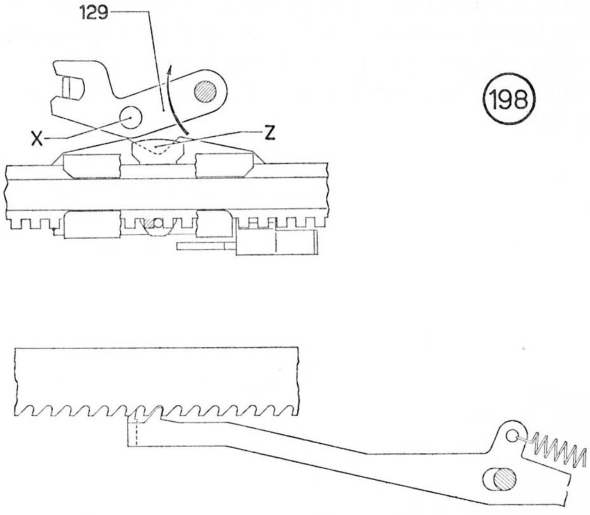


(197)



(198)

— Figure 199 illustrates the carriage at the end of the writing line, having moved:

— Two spaces after engaging the line lock.

— The additional .4 mm. (.016").

In this position the carriage is not held by the escapement dog.

— Figure 200 indicates that the electric margin key has been partially depressed. The margin set arm **129** has rotated slightly, and has reached profile **D** of the margin stop. This initial movement has moved plate **Z** forward sufficiently to release pin **P** from the margin rack, causing the following action:

The leftward movement of the carriage under the action of the main spring until stopped by the escapement dog. This movement will be equal one space less the .4 mm. (.016"), as can be seen by the position of pin P in figure 200.

— Figure 201 illustrates the position of the mechanism when the electric margin key has been fully depressed. The margin set arm has reached the bottom of the recess of profile **D**. The plate **Z** is fully forward, causing the following action:

The rightward movement of the margin stop due to the action of the margin set arm 129 and profile D.

The carriage can now be moved to the desired position, where it will be held by the escapement dog.

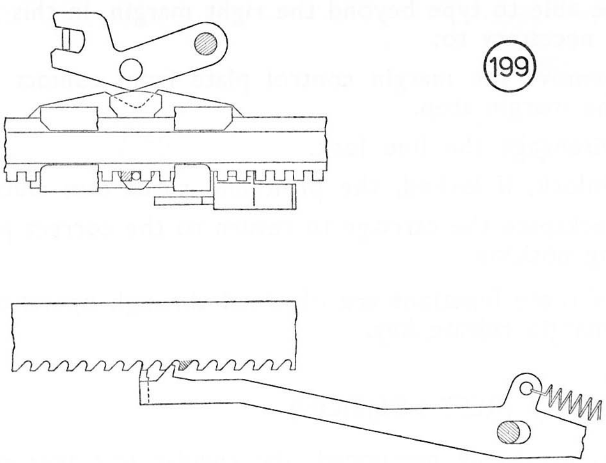
— The position of pin **P** in relation to the margin rack will always be the same as in figure 201, provided the carriage is held by the escapement dog. The tooth of the margin rack is shaded to show the reciprocal position of the margin rack and pin **P** during this operation.

— Figure 202 indicates that the electric margin key has been released. The margin set arm **129** has restored, releasing plate **Z** which allows the following action:

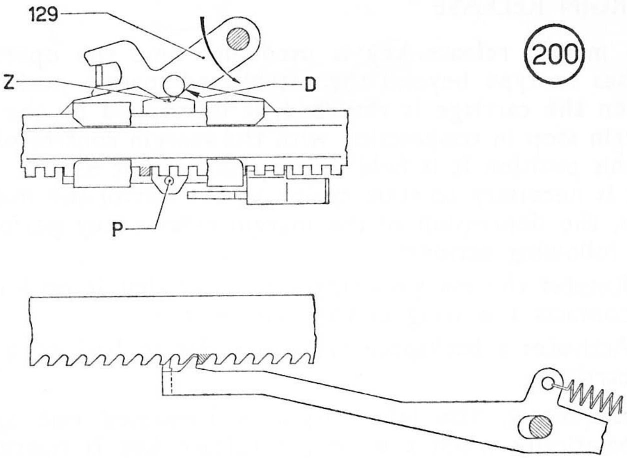
The rightward movement of the margin stop, due to the action of the line lock mechanism spring.

This additional rightward movement of the margin stop causes pin **P** to re-enter the margin rack as illustrated in figure 202.

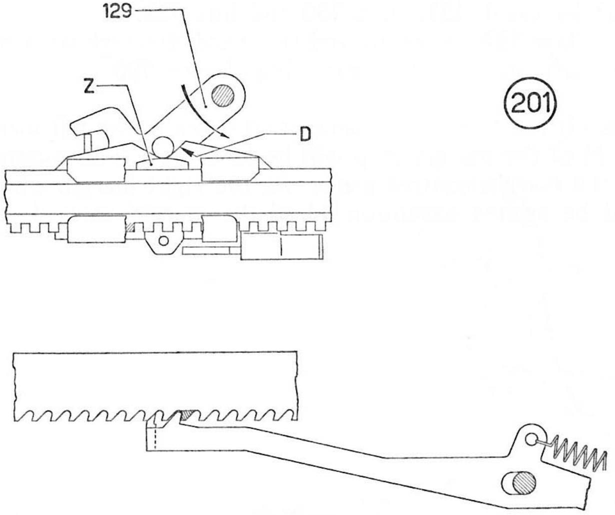
NOTE - Operation of the electric margin key without moving the carriage would result in the margin stop relocating two spaces to the right of its original position.



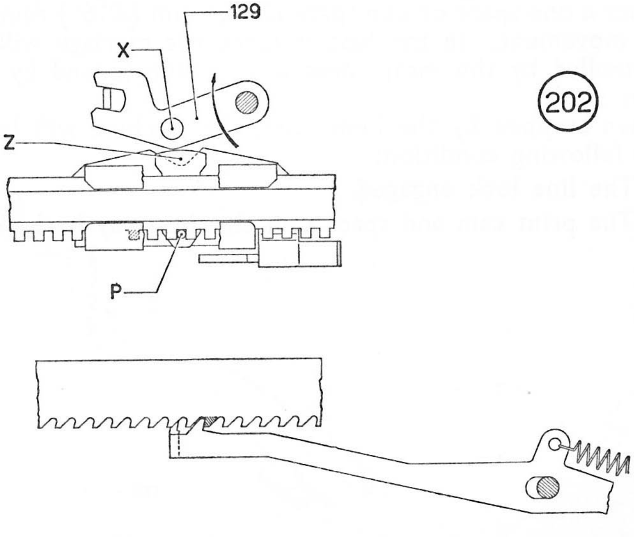
199



200



201



202

MARGIN RELEASE

The margin release key is used any time the operator wishes to type beyond the established margin positions. When the carriage is returned, it is stopped by the left margin stop in conjunction with the margin control plate. In this position it is held by the escapement dog.
If it is necessary to start typing to the left of the margin stop, the depression of the margin release key performs the following actions:

- Rotates the margin control plate so that it no longer contacts the wing of the margin stop.
- Activates a backspace cycle in order to backspace the carriage.

Consequently, the left margin is by-passed one space automatically when the margin release key is operated. The carriage may then be moved to the desired position by use of the backspace key, or manually.
When the carriage is at the end of the writing line, it has either a one space or one space plus .4 mm (.016″) remaining movement. In the first instance the carriage will be controlled by the escapement dog, in the second by the limit stud.
When stopped by the limit stud, the machine will be in the following condition:

- The line lock engaged.
- The print cam and space cam clutches may be locked.

To be able to type beyond the right margin, in this case, it is necessary to:

- Remove the margin control plate from contact with the margin stop.
- Disengage the line lock.
- Unlock, if locked, the print and space cam clutches.
- Backspace the carriage to return to the correct printing position.

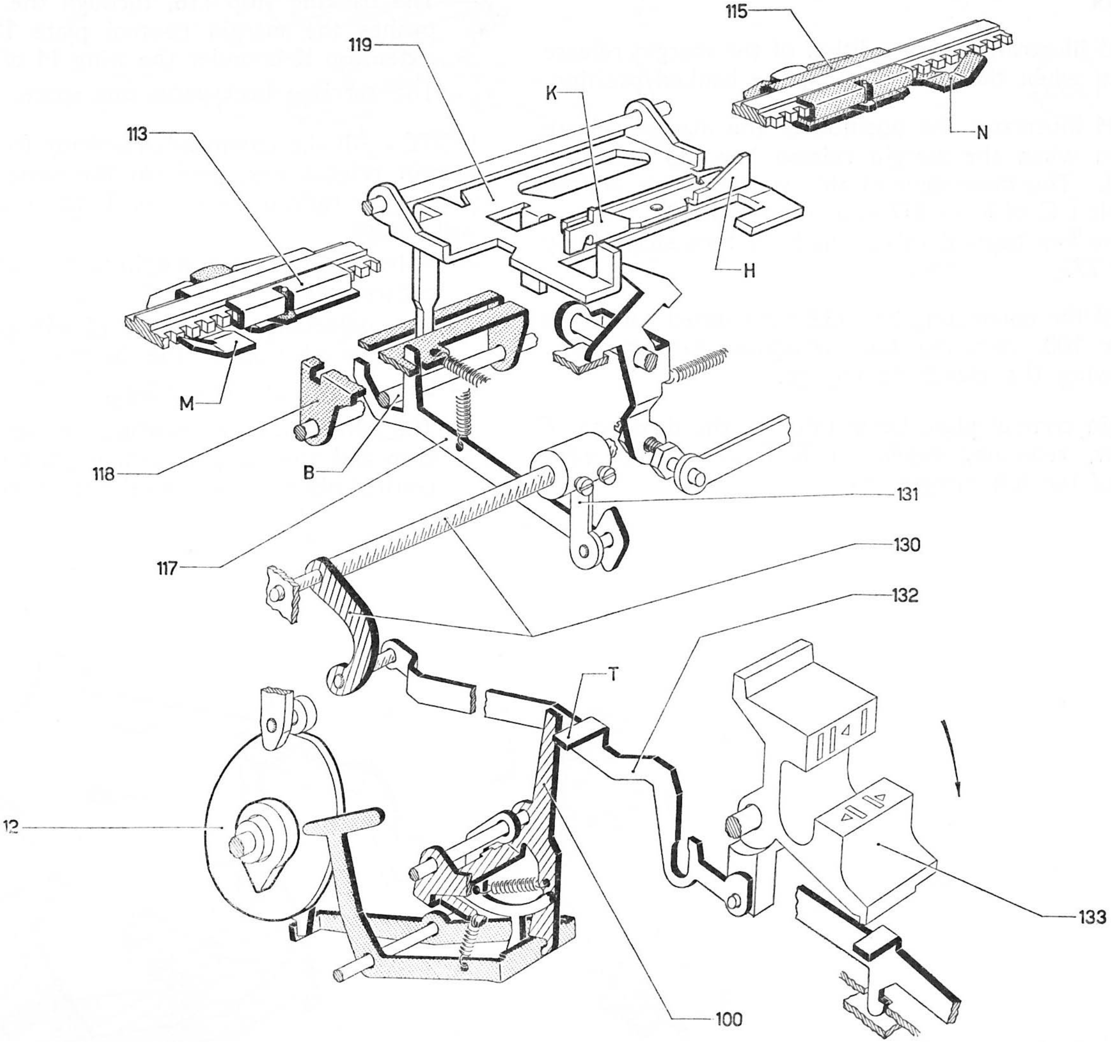
All of these functions are obtained through operation of the margin release key.

ASSEMBLY (REST POSITION)

- As previously mentioned, the angular rest position of the Margin Control Plate **119** is determined by lever **117** detenting on shaft **B**.
  The lever **117** is connected to the margin release key **133** by crank **131**, shaft **130** and link **132**.
  The link **132**, when moved rearward, through its wing **T** will actuate the Backspace Trip Lever **100**.

NOTE - It must be remembered that when at the left margin, wing **M** of the margin stop will be in contact with extension **K** of the margin control plate. At the right margin wing **N** would be against extension **H** of the margin control plate.

(203)



ACTIVATION

— Figure 205 illustrates the condition of the margin release mechanism when the carriage is in the banked position.

— Figure 204 illustrates the position of the margin release mechanism when the margin release key **133** has been depressed. The movement of this mechanism is limited by extension **C** of lever **117** contacting shaft **B**. Depression of the key beyond this point is in turn stopped by the lever **77**.

— Wing **T** of the connecting link **132** has rotated backspace trip lever **100**, releasing the backspace starting lever, thus allowing the clutch to engage.

— The margin control plate has rotated in the direction of the arrow, removing extension **K** from contact with wing **M** of the left margin stop.

— The banking stop **116**, through the action of its spring, pushes the margin control plate **119** leftward so that extension **K** is under the wing **M** of the margin stop.

— The carriage backspaces one space.

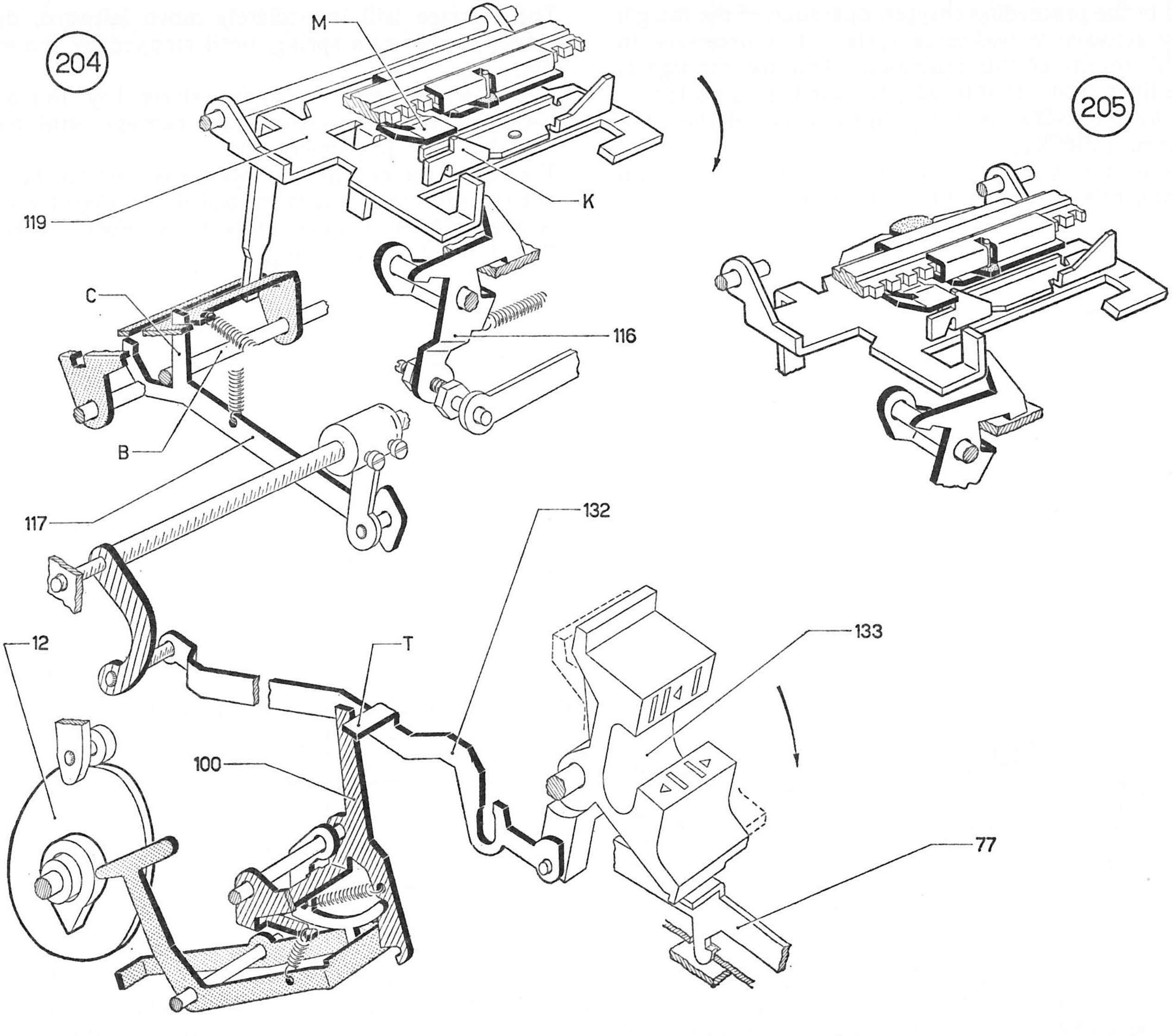
NOTE - All the commands resulting from depression of the margin release key, perform the same functions when bypassing the right margin stop. In this case, the margin release will cause:

— Release of the right margin stop by rotation of the margin control plate.

— The unlocking, if locked, of the print and space cam clutches (Action of the backspace cycle).

— Backspacing of the carriage.

The elimination of contact between the right margin stop and the margin control plate, enables the margin control plate to move to the right, releasing the line lock.


204

205

As covered in the preceeding chapter, operation of the margin release key activates a backspace cycle. It is necessary to examine the results of this operation when the carriage is against the limit stud. In this case, the carriage is no longer controlled by the escapement dog and has moved the additional .4 mm. (.016″).

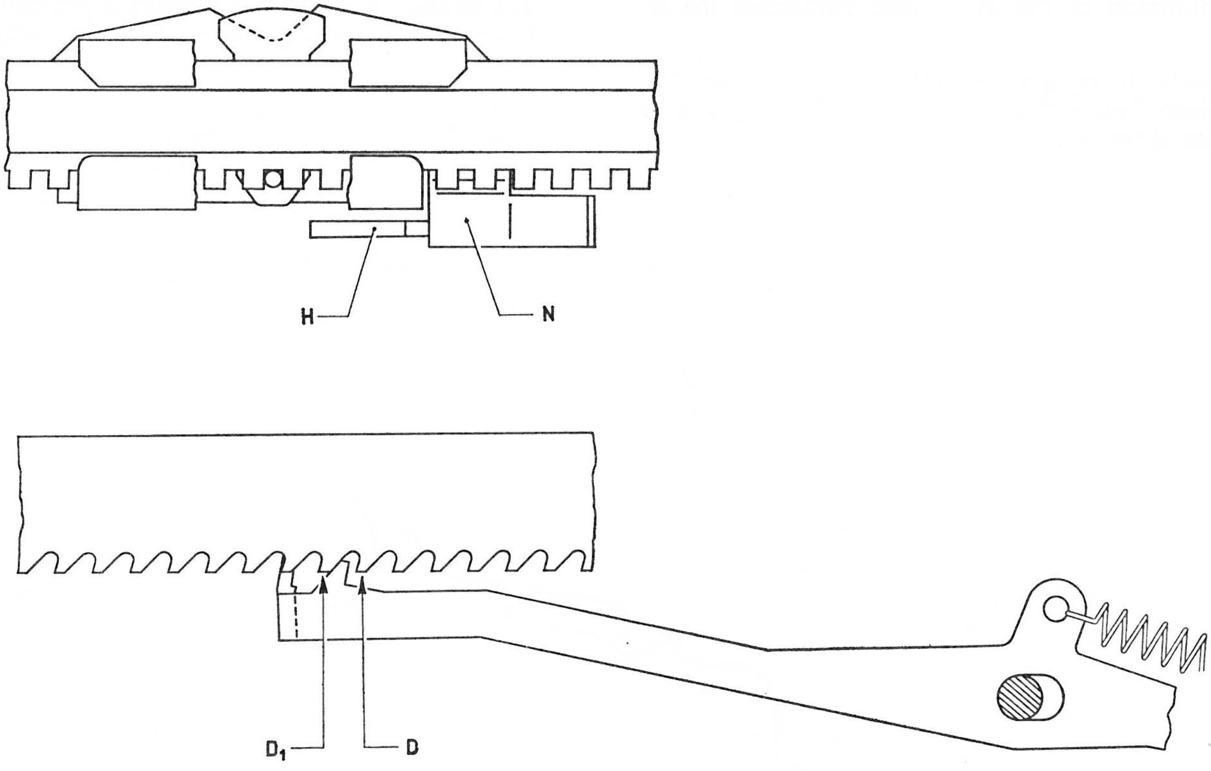
Depression of the margin release key rotates the margin control plate, releasing wing **N** of the margin stop.

The carriage will immediately move leftward, due to the action of the main spring, until stopped by the escapement dog.

The operation of the margin release key also activating a backspace cycle, backspaces the carriage until tooth $\mathbf{D}_1$ is held by the escapement dog.

Therefore, the original carriage movement to the left cancels out the backspace movement and the carriage has only moved .4 mm. (.016″). Consequently, the carriage is correctly positioned for further typing.

206



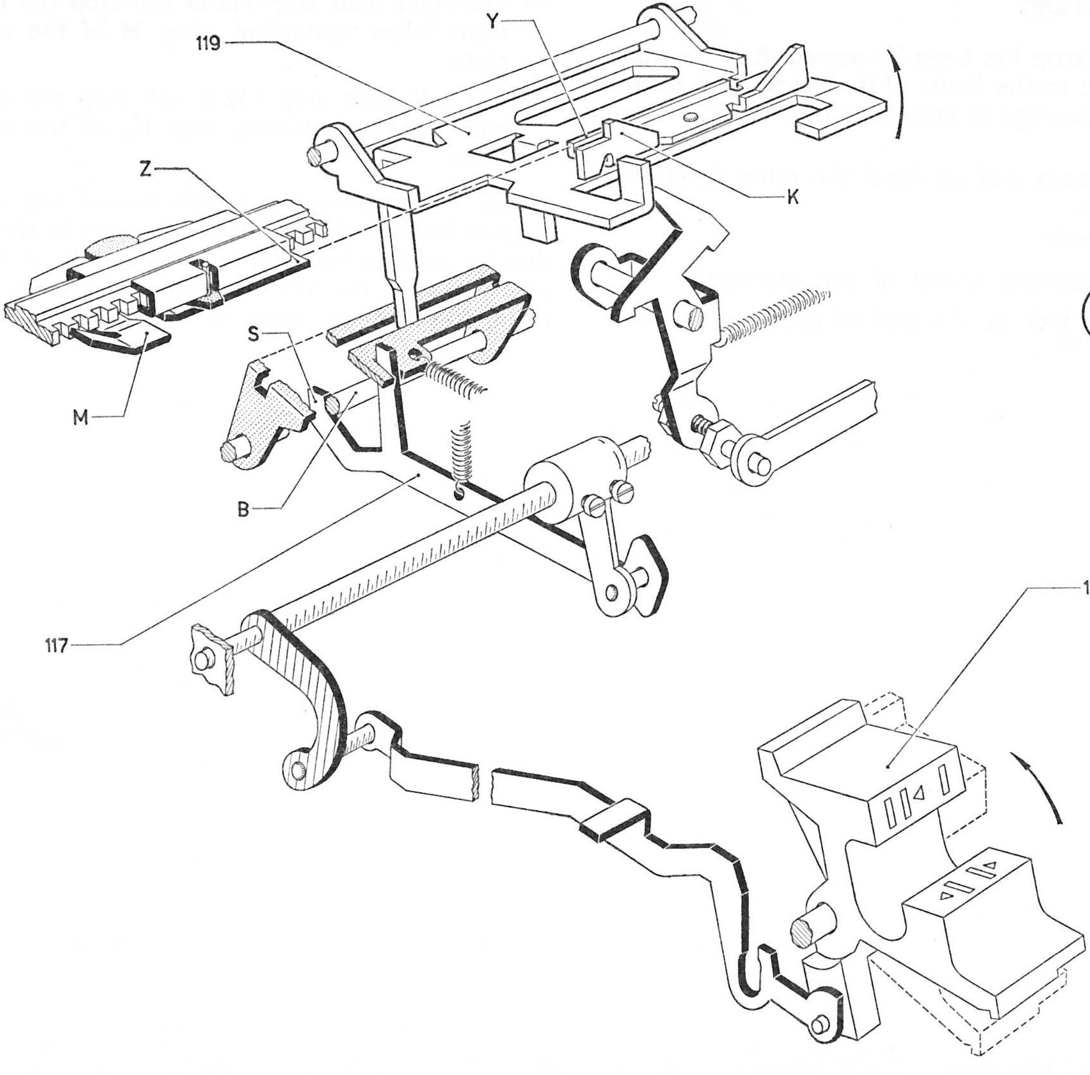
PARAGRAPH INDENTATION

To improve the appearance of typewritten work, it is sometimes desireable to indent the first line of a paragraph. Paragraph indentation is accomplished by placing an alternative stopping point in the path of the left margin stop, when the carriage is being returned.
This is the function of the Automatic Paragraph Indentation Key.

— The automatic paragraph key **133** is integral with the margin release key, and utilizes the same linkage, only in the reverse direction.

Operation of the paragraph indentation key rotates the margin control plate until stopped by arm S of lever **117** contacting shaft B.

— If the mechanism is maintained in this position during return of the carriage, winz Z of the left margin stop will contact lip Y of the margin control plate **119**.
The carriage will then be stopped a pre-determined distance before reaching the normal left margin.



207

CARRIAGE LIMIT STOPS

Once either margin stop has been by-passed, it is possible to move the carriage to the limits of its travel. The maximum travel of the carriage is established by the Carriage Limit Stops.

The carriage limit stops will perform the same functions as the margin stops.

In particular, they will:

— Establish the maximum travel of the carriage.

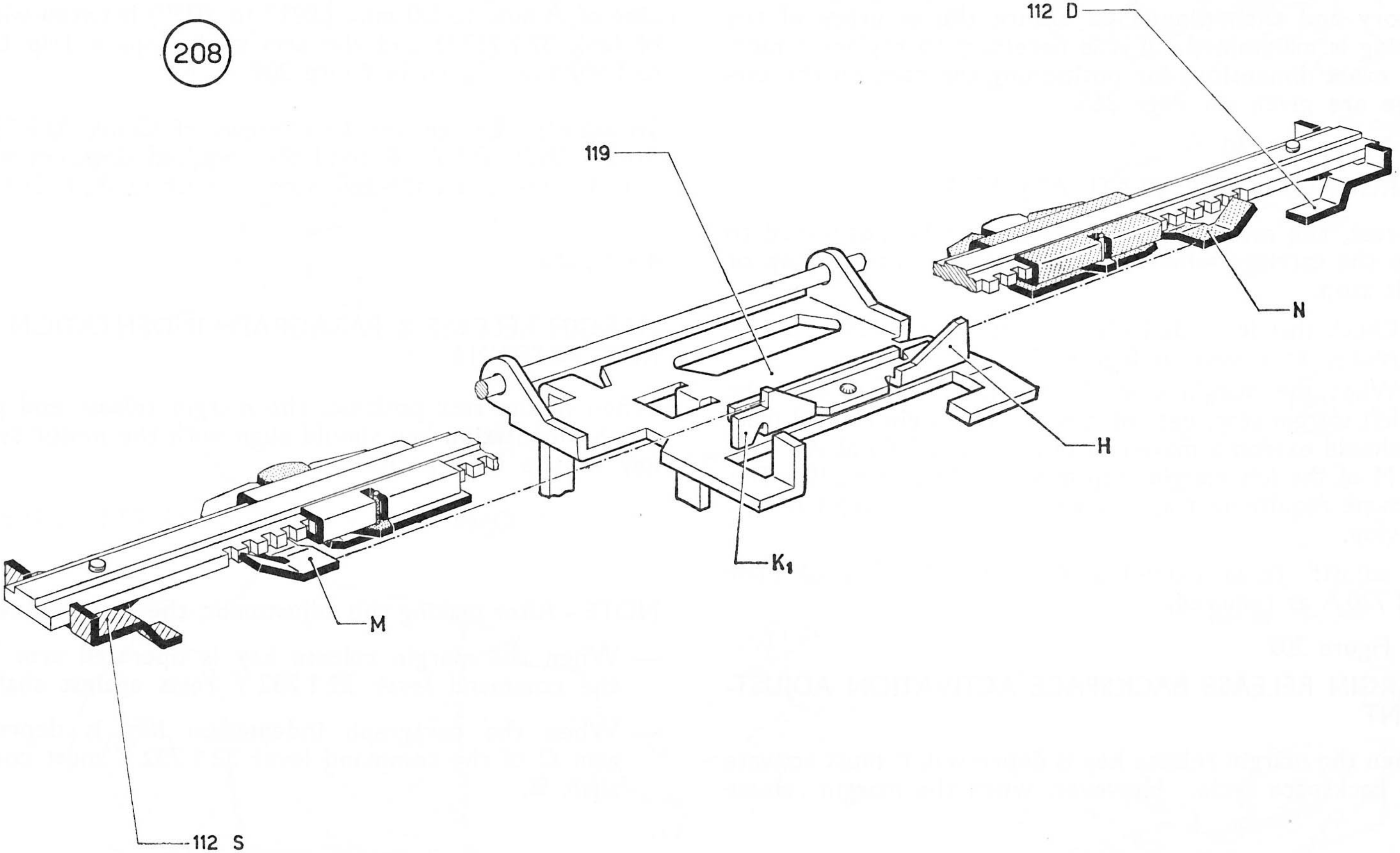
— Activate the line lock at the end of the writing line.

— The right limit stop **112 D** will stop the carriage movement when contacting wing H of the margin control plate.

— The left limit stop **112 S** will stop the carriage movement when contacting step K_1 of the margin control plate.

NOTE - Depressing the margin release key allows the carriage to be moved ***two*** additional spaces to the right. This is due to the fact that the upper step of the margin control plate becomes the limiting point. In this position, the carriage would be two space to the right of the zero position.

208



ADJUSTMENTS

MARGIN RACK POSITION

The position of the margin rack is set by a gauge at the factory and then pinned to ensure the accuracy of the setting is maintained. If it is necessary to replace a rack, the exact dimensions for positioning the rack on the carriage are given on Page 365.

2 - Figure 209-210

MARGIN CONTROL PLATE ADJUSTMENT

At rest, the margin control plate must be positioned to stop the carriage when it contacts either margin stop or limit stop.

— Check that lever 32 1 732 Y is detenting on shaft **B** correctly, as shown in figure 209.

— When the margin control plate is in contact with the left margin stop, extension **K** of the margin control plate should extend a maximum of .5 mm. (.020″) above wing **M** of the left margin stop as shown in figure 210. This same requirement applies when against the right margin stop.

To adjust: Form extension **A** of Margin Control Plate 32 1 730 A as required.

3 - Figure 209

MARGIN RELEASE BACKSPACE ACTIVATION ADJUSTMENT

When the margin release key is depressed, it must activate the backspace cycle. However, when the margin release key is in rest position, it must not interfere with the backspace trip lever during normal backspace operation.

With the margin release key at rest, there must be a clearance of .8 mm. to 1.0 mm. (.031″ to .039″) between wing **T** of Link 32 1 753 D and the arm of Backspace Trip Lever 32 1 507 Y as shown in figure 209.

To adjust: Loosen the two screws of Crank 32 1 736 U. Rotate Shaft 32 1 749 R until the required clearance is obtained. Re-tighten the two screws of Crank 32 1 736 U.

4 - Figure 209

MARGIN RELEASE & PARAGRAPH INDENTATION KEY REST POSITION

When in the rest position, the margin release and paragraph indentation key should align with the motor switch key in the OFF position.

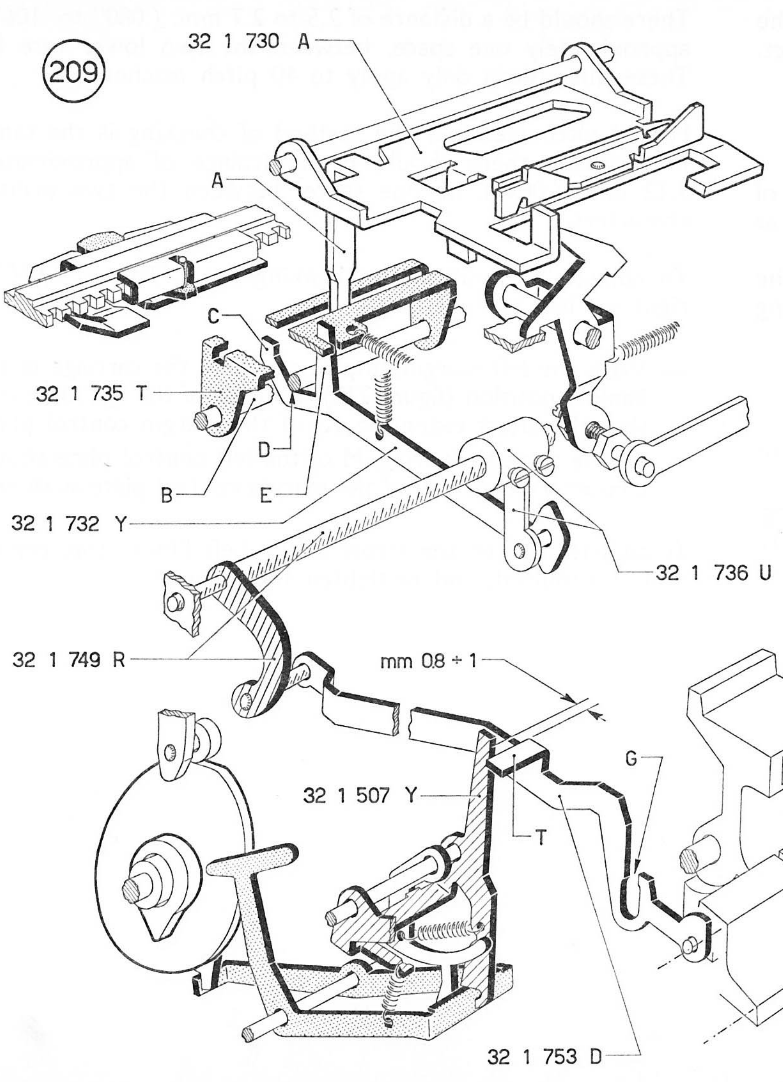
To adjust: Open or close slot **G** in Link 32 1 753 D as required.

NOTE - After making this adjustment, check the following:

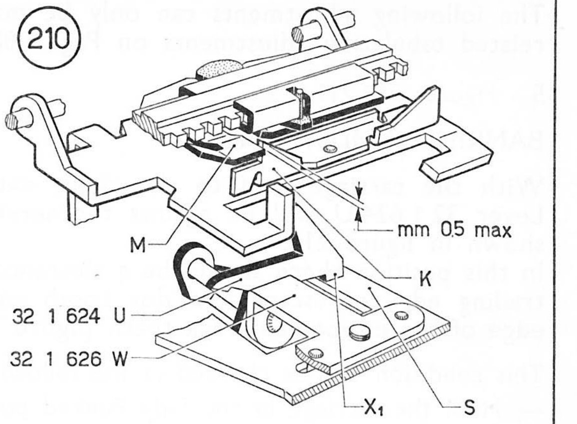
— When the margin release key is operated arm **E** of the command lever 32 1 732 Y rests against shaft **B**.

— When the paragraph indentation key is depressed arm **C** of the command lever 32 1 732 Y must contact shaft **B**.

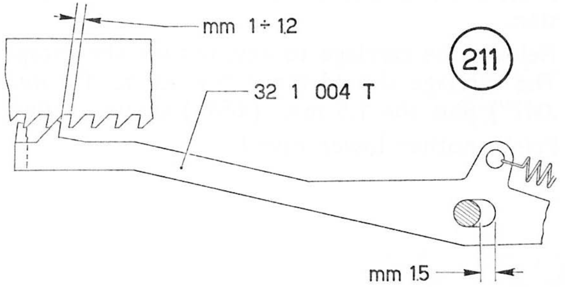
209



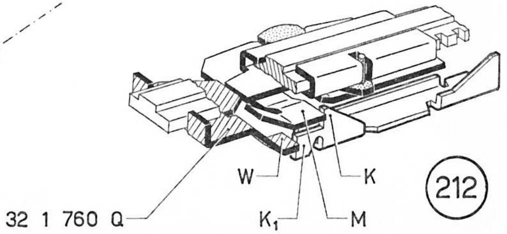
210



211



212



The following adjustments can only be made when the related tabulation adjustments on Page 288 are correct.

5 - Figures 210-211-212

BANKING ADJUSTMENT

**With the carriage held to the right, extension X_1 of Lever 32 1 624 U will be against the service plate S as shown in figure 210.
In this position there should be a clearance between the trailing edge of escapement dog tooth and the leading edge of the escapement rack teeth (figure 211).**

This condition can be checked in the following manner:

- Hold the carriage in the fully Banked position.
- Print a lower case l with the machine held in this position.
- Release the carriage to rest against the escapement dog. The carriage should move the 1.0 to 1.2 mm. (.039″ to .047″) plus the 1.5 mm. (.059″) shown in figure 211.
- Print another lower case l.

There should be a distance of 2.5 to 2.7 mm. (.080″ to .106″), approximately one space, between the two lower case l's. These dimensions only apply to 10 pitch machines.

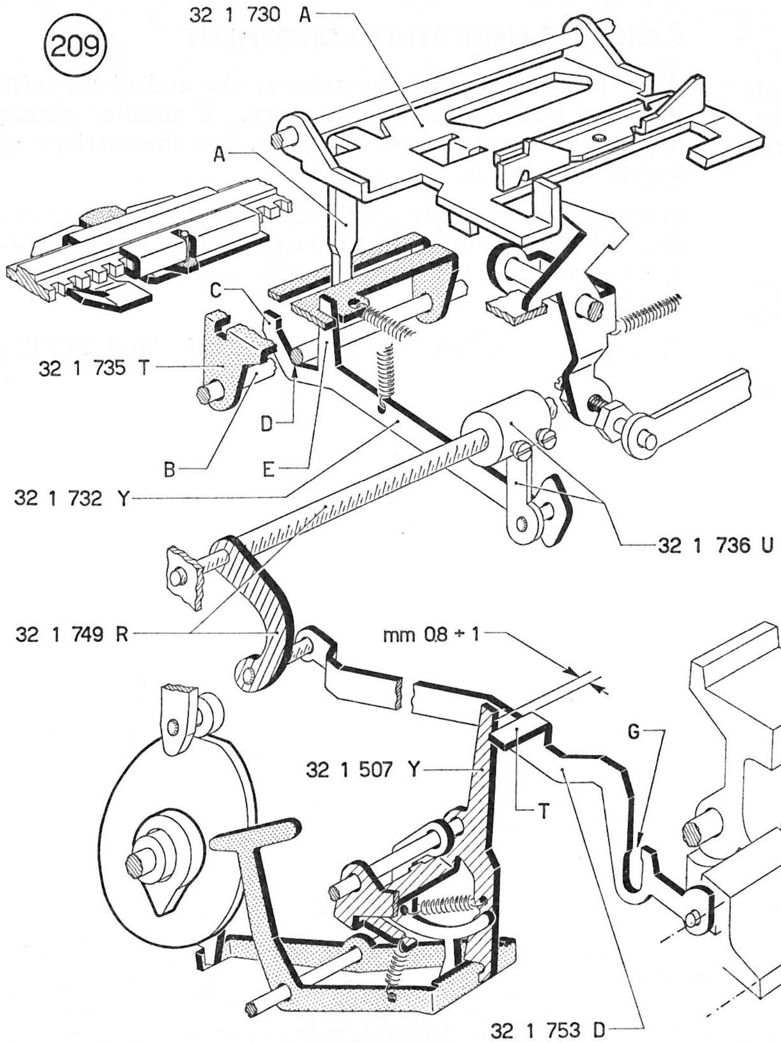
For 12 pitch machines the method of checking is the same. In this case there should be a distance of approximately 2.12 mm. (.083″), or one space, between the two printed characters.

To adjust: Reposition the Banking Stop Plate 32 1 626 W right or left as required.

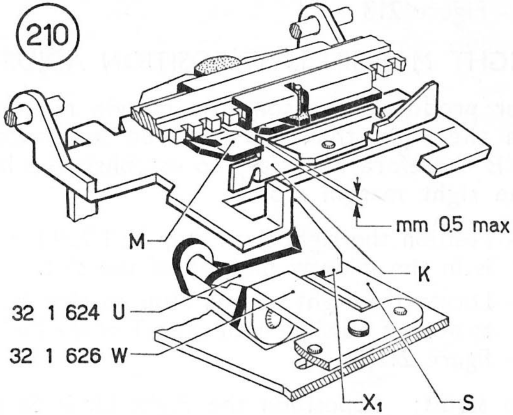
- With the left margin stop at zero and the carriage in the banked position (figure 212), wing **W** of the left limit stop should contact extension **K_1** of the margin control plate. At the same time wing **M** of the left control plate should contact extension **K** of the margin control plate as shown.

To adjust: Loosen the screw of the Left Limit Stop, reposition as required, and re-tighten the screw.

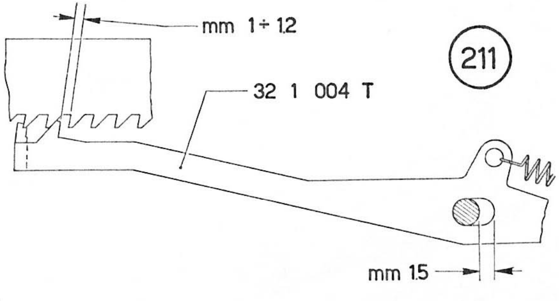
209



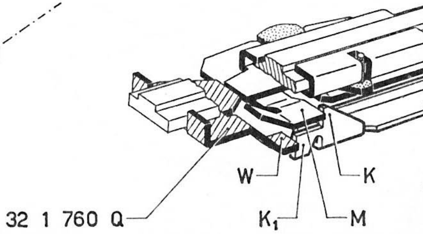
210



211



212



6 - Figure 213

RIGHT MARGIN LAST POSITION ADJUSTMENT

For production reasons the margin rack has more teeth on the right than are required for machine operation. It is therefore necessary to establish the last position for the right margin stop.

— Position the right limit stop 32 1 759 K so that its screw is in the midway position of the slot.

— Locate the right margin stop so that its wing **N** aligns as near as possible with wing **T** of the limit stop, (line **a-a**, figure 213).

To adjust: Reposition the Right Limit Stop 32 1 759 K to obtain perfect alignment between wings **N** and **T**.

7 - Figure 214

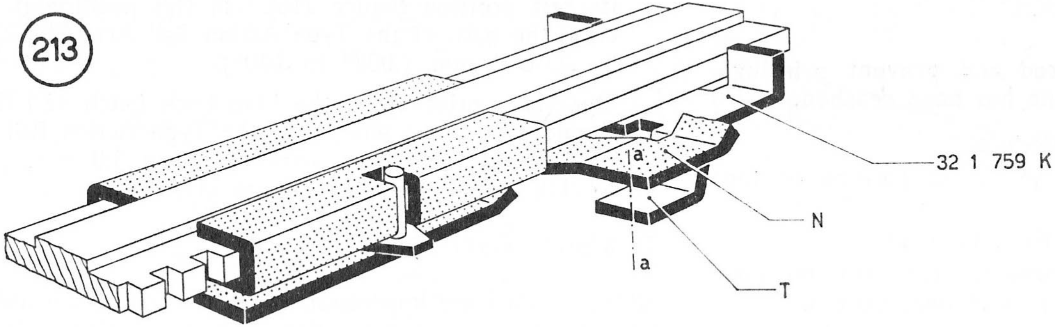
CARRIAGE LIMIT STUD ADJUSTMENT

After printing the last character at the end of the writing line, the carriage moves one space. If another character key is depressed it does not print, but the carriage again moves one space.

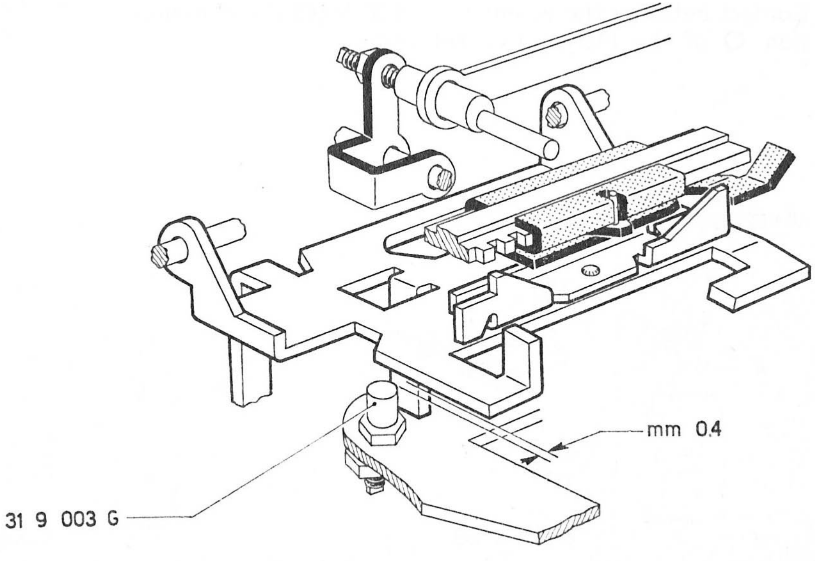
In this position the carriage should be held by the escapement dog and there should be a clearance of .4 mm. (.016″) between the lower extension of the margin control plate and the Limit Stud 31 9 003 G.

To adjust: Regulate the Eccentric Limit Stud 31 9 003 G.

213



214



8 - Figures 215-216-217

LINE LOCK ADJUSTMENT

The line lock must be activated and prevent printing, after the end of the printing line has been reached.

To check, use the following procedure:

- Move the right margin stop to its last position on the margin rack.
- Position the carriage against the limit stud.
- Depress the backspace key three times, so that the carriage backspaces two spaces plus .4 mm. (.016″).
- Ensure that extension **H** of the margin control plate is in contact with wing **N** of the right margin stop (fig. 215).

Adjust the eccentric stud 31 9 248 Z (figure 215) to obtain the following conditions:

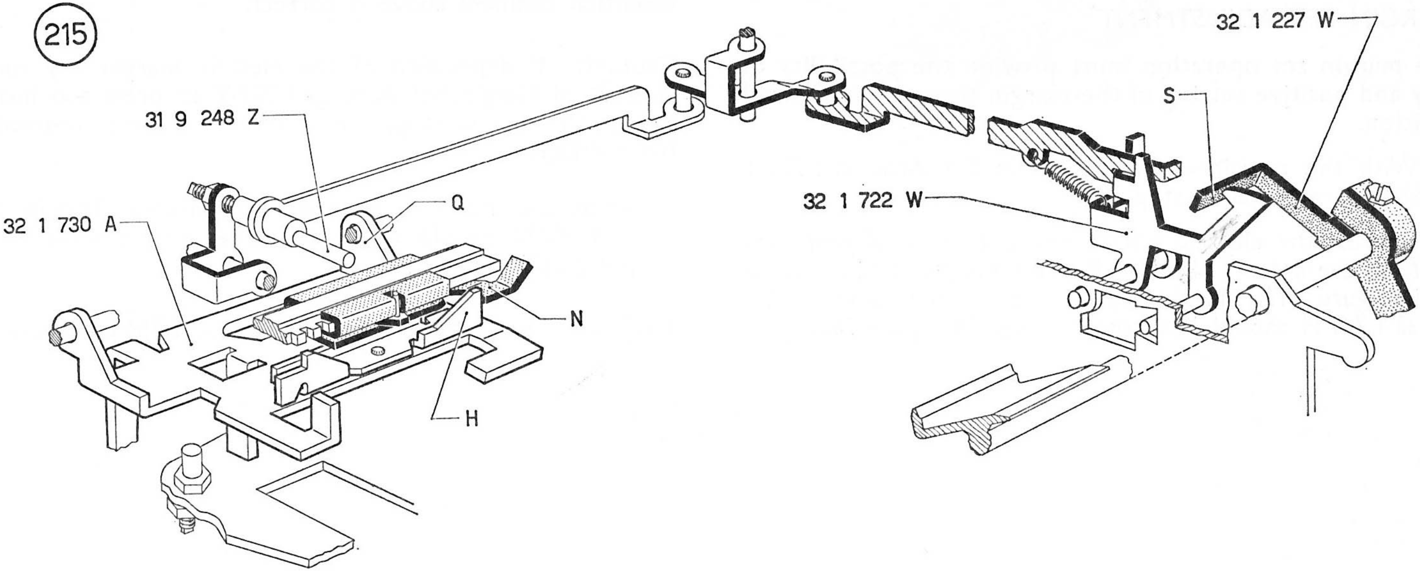
- Contact between the eccentric stud 31 9 248 Z and extension **Q** of the Margin Control Plate.
- The hook of the Line Lock Latch 32 1 722 W just leaves its rest position (figure 216). In this position it must clear the path of the Type Action Bail Arm 31 1 277 W by .2 to .5 mm. (.008″ to .020″).
- Operate a print cycle, the Line Lock Latch 32 1 722 W should pass above wing **S** of the Type Action Bail Arm 32 1 277 W, with a clearance of 2.3 to 3.0 mm. (.092″ to .118″) as illustrated in figure 217.

To adjust: Form wing **S** as required.

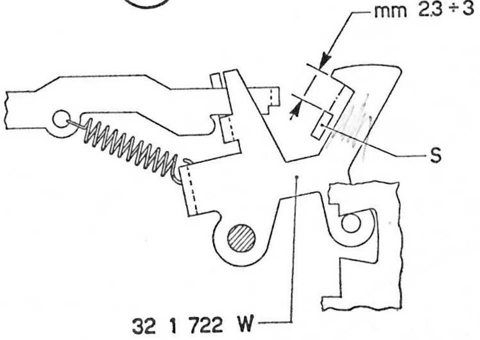
NOTE - With the impression control at maximum and the segment in upper case position, operate a print cycle, and verify the previous conditions.
In this manner the adjustments have been proved in the most critical conditions, which are:

- Maximum type action bail speed.
- Minimum carriage main spring pull.

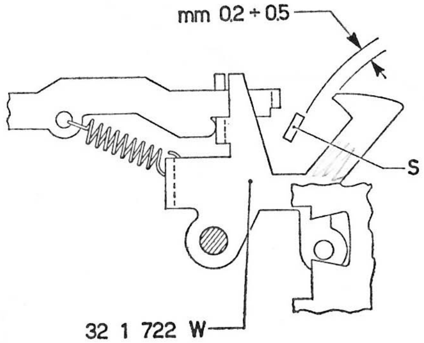
215


32 1 227 W
S
31 9 248 Z
Q
32 1 722 W
32 1 730 A
N
H

217


mm 2.3 ÷ 3
S
32 1 722 W

216


mm 0.2 ÷ 0.5
S
32 1 722 W

9 - Figure 218-219

MARGIN SET ADJUSTMENT

The margin set operation must provide the possibility of easy and positive setting of the margin stop to the desired position.

— With the machine at rest, Margin Set Arm 32 1 727 T should rest against stop **K**.

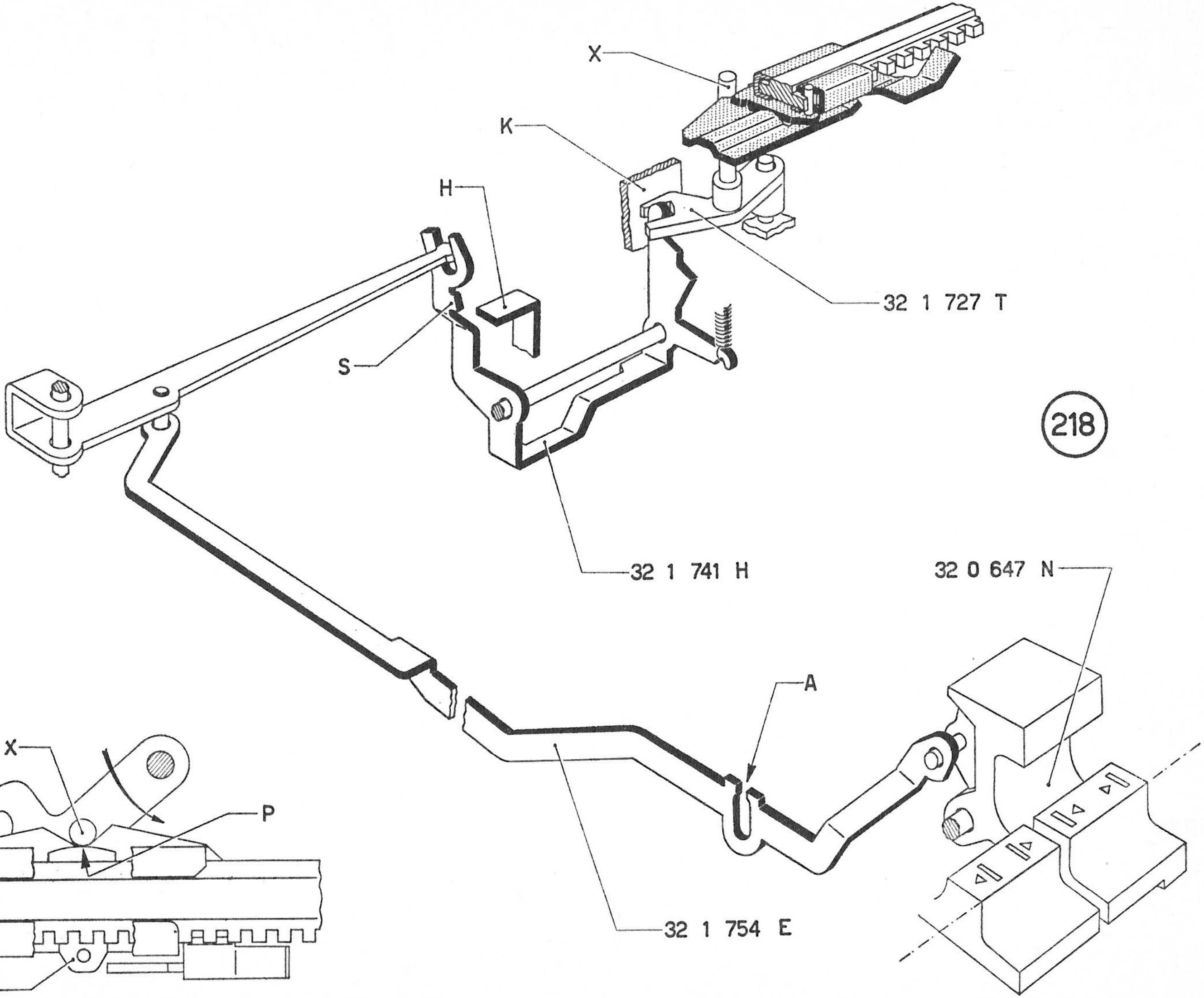
— Depress the electric margin key until stud **X** ***just contacts*** the bottom of recess **P** in the margin stop, as shown in figure 219. In this position, projection **S** of Bridge 32 1 741 H should just contact Stop **H**, figure 218.

To adjust: Form the stop **H** forward or rearward until the condition outlined above is correct.

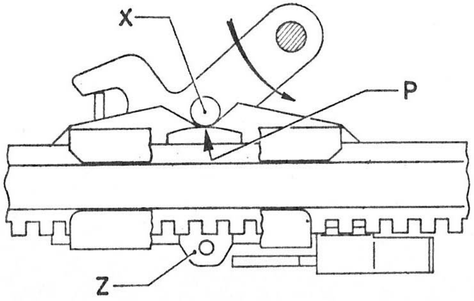
Caution: If depression of the electric margin key causes stud **X** of Margin Set Arm 32 1 727 T to press too heavily against the margin stop, this will restrict the movement of the carriage.

— With the machine at rest, the Electric Margin Key 32 1 647 N should align with the margin release and paragraph indentation key.

To adjust: Open or close slot **A** in Link 32 1 754 E as required.



218



219

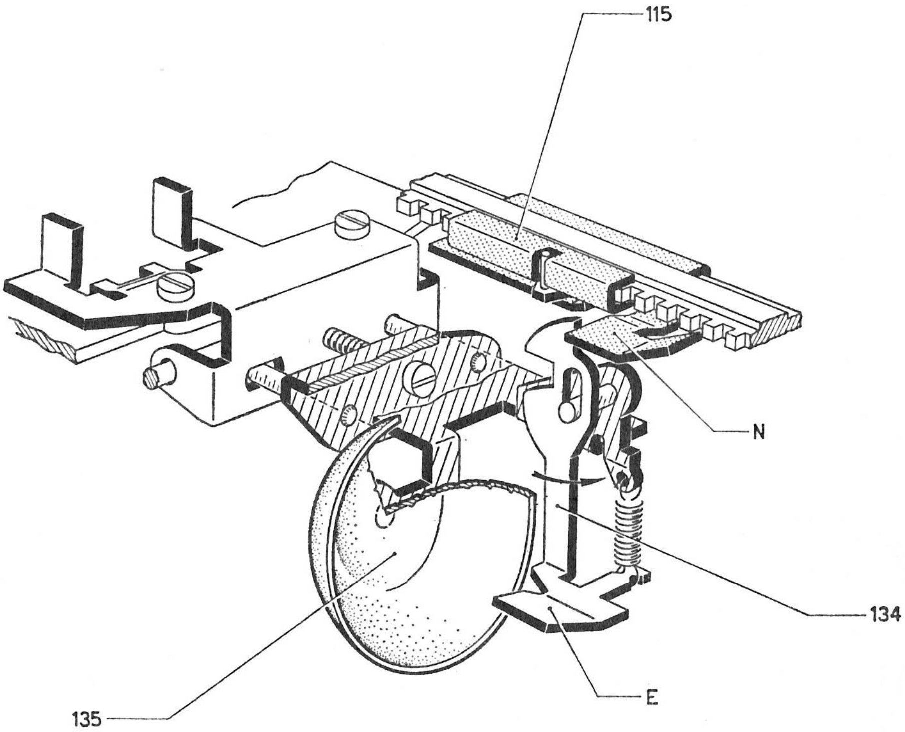
BELL

BELL

The purpose of the bell is to alert the operator that the carriage is approaching the end of the writing line. The bell rings approximately seven spaces before the line lock engages.

As the carriage moves to the left wing **N** of the right margin stop **115** contacts the Bell Hammer **134**. The continued movement of the carriage pivots the bell hammer until it passes beyond the holding point. The bell hammer then releases and strikes the Bell **135** due to the pull of its spring.

220



TABULATION

FOREWORD

The tabulator is a feature which facilitates the rapid movement of the carriage to predetermined positions.
The following example illustrates a typical application of tabulation.

NAME	ADDRESS	CITY
Joe Doe	58 Main Street	New York
Tom Mix	24 Capital Street	Hartford
Joe Smith	15 Farmington Ave.	Los Angeles

The typing of the above format is obtained by setting a stop to correspond with the starting position of each column. Each one of the desired positions can then be reached by simple depression of the tabulator bar.

TAB SET - TAB CLEAR

ASSEMBLY (REST POSITION)

— The tabulation stops **140** are mounted in the carriage base frame and are held in either set or clear position by a leaf spring. The distance between each of the tabulation stops is always equal to the pitch of the machine.

The positioning of the tabulation stops is obtained through the following mechanism:

— Tab Set Plate **142** with finger **141**.

— Tab Clear Blade **136**.

— The angular rest position of the tab set plate is determined by lip **A**, and that of the tab clear by lip **A$_1$**. Both the tab set and tab clear establish the rest position of the key through slide **143**, lever **138** and link **137**.

TABULATION STOP SETTING

Through this operation a tabulation stop will be set in the working position, figure 223. When set, a tabulation stop is positioned so that its extension H can stop the carriage movement.

— Rotating the tab set and clear key in the direction of the arrow causes the tab set plate **142**, through parts **137**, **138** and **143**, to pivot and set a tabulation stop. The operative position of the tabulation stop is maintained by the detenting action of spring **m**. The amount of rotation of the key **136** is controlled by extension **R** of slide **143** limiting on lip **T** of the support **S**.

— The finger **141** of the tab set plate **142** has the possibility of rocking to prevent lockages in case the machine is operated improperly. The tab set finger **141** would rock if during a tab set operation the carriage is moved.

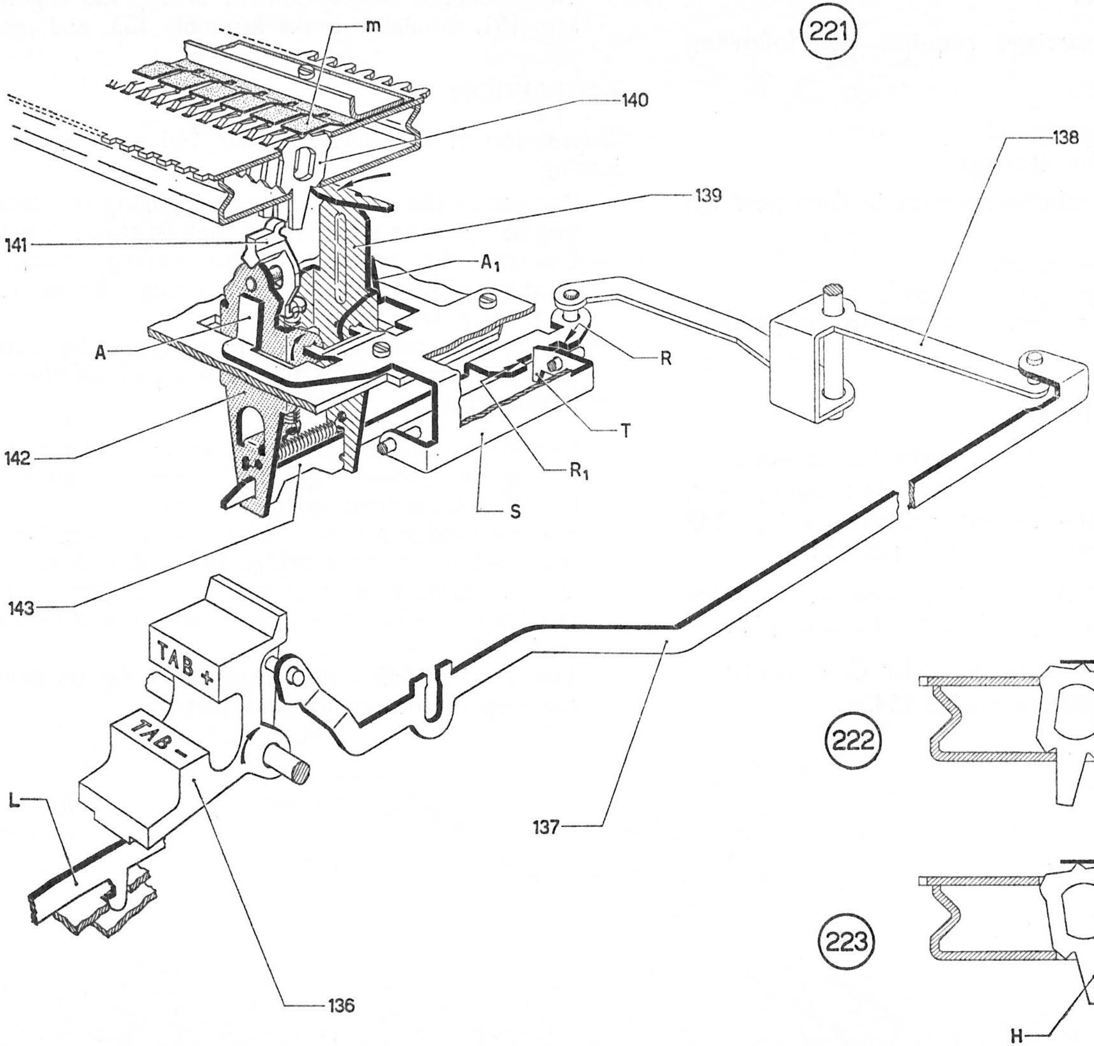
TABULATION STOP CLEARING

The tab clearing operation enables the resetting to inoperative position, of one or more tabulation stops, figure 222. When cleared, a tabulation stop is no longer in position to stop the carriage movement.

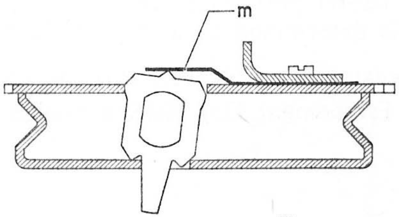
— Rotating the tab set and clear key in the direction opposite to the arrow causes the tab clear blade **139**, through parts **137**, **138** and **143**, to pivot and reset the corresponding tabulation stops. The amount of rotation of the tab clear blade **139** is stopped by extension **R** of slide **143** limiting on lip **T**. The rotation of the key **136** is limited by lever **L**.

— The clearing of all tabulation stops can be obtained by holding the key **136** in a tab clear position and moving the carriage in either direction.

221



222



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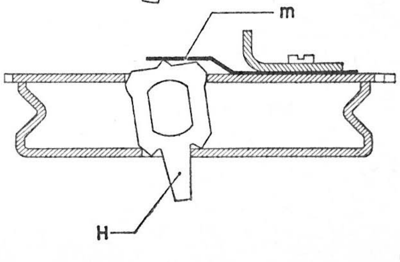


CARRIAGE TABULATION

The tabulation of the carriage requires the following actions:

- — Release the carriage.
- — Control of the carriage speed.
- — Preset the stop of the carriage.

The stop of the carriage tabulation must in turn perform the following:

- — Stop the carriage movement.
- — Disengage the carriage speed control.
- — Return the tabulation stop control to inoperative position.

ASSEMBLY (REST POSITION)

Figure 274 illustrates the tabulator mechanism at rest.

- — The rest position of the Tabulator Bar **144** is determined, through link **145**, by the Tabulator Control Bridge **147** limiting in the slot of the service unit plate **S**.
- — The lateral position of the Tabulator Bracket Assembly **149** is determined by a step of the service unit plate **S**.

The tabulator assembly **149**, through collar **C**, controls:

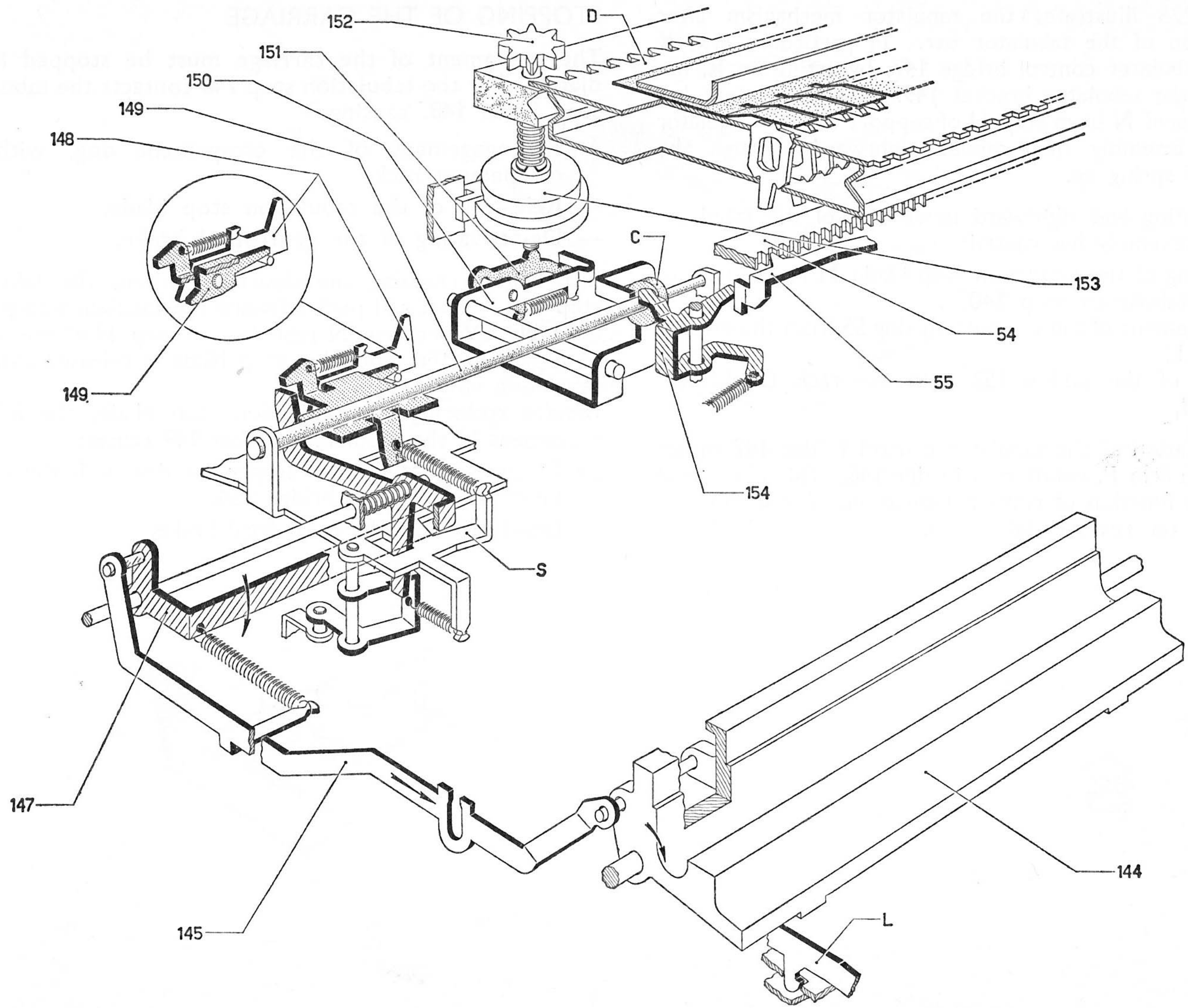
- — The Escapement Dog Release Bridge **154**.
- — The Tabulator Brake Control Bridge **150** together with arm **151**, tabulator brake assembly **153**, and pinion **152**.

ACTIVATION

Depression of the tabulator bar **144** must cause the following:

- — Release of the carriage, by disengaging the escapement dog **55** from the escapement rack **54** through bridge **154**.
- — Control the carriage speed during tabulation, by meshing pinion **152** of the centrifugal brake with tabulator rack **D**.
- — Preset the stopping of the carriage, by raising the tabulation stop blade **148** in the path of the set tabulation stop.

- — Depression of the Tabulator Bar will cause it to rotate, pulling the Connecting Link **145** forward until the tabulator bar is stopped by the key levers **L**.
  The forward movement of the connecting link rotates the tabulator control bridge **147** in the direction of the arrow. This rotation causes the rear arm to pivot the tabulator bracket assembly raising the tabulation stop blade **148**.
  The bracket **149** will consequently be unlatched from the step of the service unit plate **S**.



224

— Figure 225 illustrates the tabulator mechanism after depression of the tabulator bar. In particular, arm K of the tabulator control bridge **147**, by acting on R, has pivoted the tabulator bracket **149**. This movement has released arm N from step H of support S. The tabulator bracket assembly then moved rightward through the action of spring m.

— The pivoting and rightward movement of the tabulator bracket assembly has caused:

— Positioning of the tabulation stop blade M in the path of the set tabulation stop **140**.

— Disengagement of the escapement dog **55** from the escapement rack.

— Meshing of the pinion **152** with the rack D through spring M_1

NOTE - Rotation of the tabulator control bridge **147** causes also, through arm P, rotation of bridge **146**. This movement provides the function of reverse tabulation. For details see the section on reverse tabulation.

STOPPING OF THE CARRIAGE

The movement of the carriage must be stopped immediately after the tabulation stop 140 contacts the tabulation stop blade 148, causing:

— Re-engagement of the escapement dog, with the escapement rack.

— Releasing of the tabulation stop blade.

— De-activating of the centrifugal brake.

Just before reaching the desired position, the tabulation stop will contact and push leftward the tabulation stop blade assembly. When arm N relatches on step H of the service unit plate S, the tabulation stop blade is released from the tabulation stop.
Besides restoring the tabulation stop blade, the leftward movement of the tabulator bracket **149** causes:

— Re-engagement of the escapement dog with the escapement rack, through bridge **154**.

— Deactivation of the centrifugal brake.

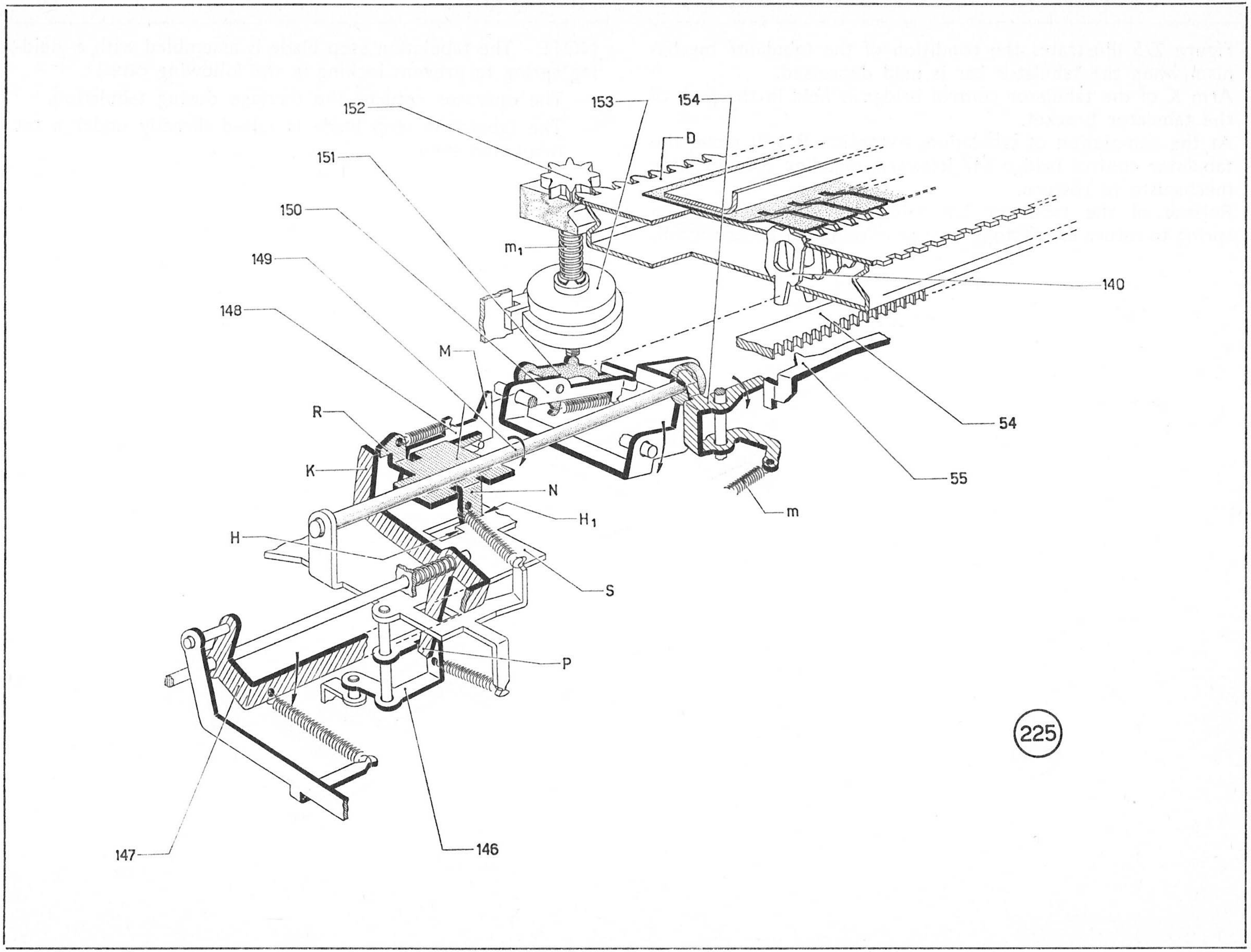

152
153
154
D
151
150
m₁
149
140
148
M
R
54
K
N
55
H₁
m
H
S
P
147
146
225

Figure 225 illustrates the condition of the tabulator mechanism when the tabulator bar is held depressed.

Arm **K** of the tabulator control bridge is held in the path of the tabulator bracket.

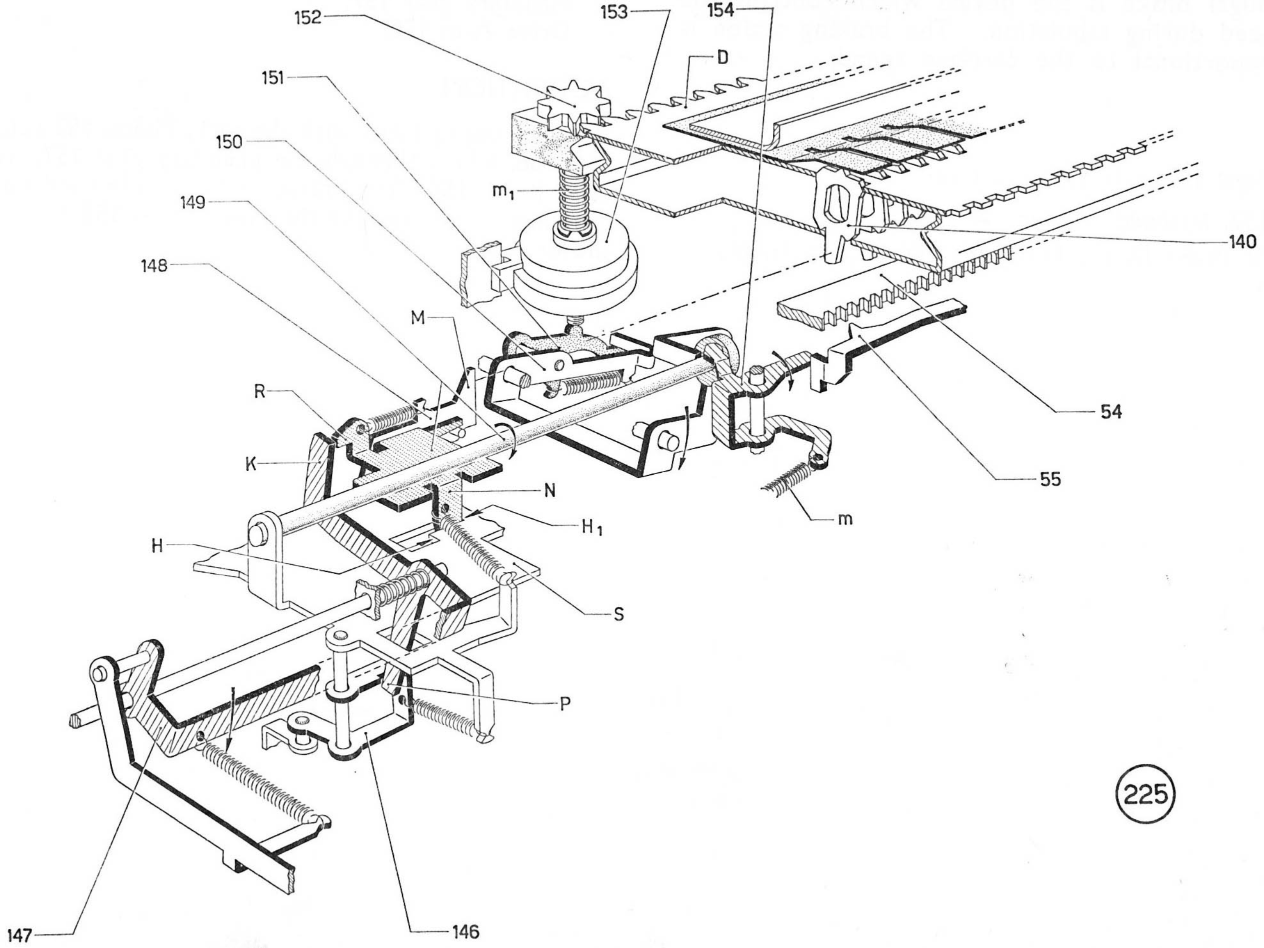
At the completion of tabulation, extension **R** will move the tabulator control bridge **147** leftward, enabling the tabulator mechanism to restore.

Release of the tabulator bar will allow the compression spring to return arm **K** to its rest position under protrusion **R**.

NOTE - The tabulation stop blade is assembled with a yielding spring to prevent locking in the following cases:

— The operator returns the carriage during tabulation.

— The tabulation stop blade is raised directly under a set tabulation stop.



225

CENTRIFUGAL BRAKE

The centrifugal brake is the device which controls the carriage speed during tabulation. The braking action is directly proportional to the carriage speed.

ASSEMBLY

The centrifugal brake is composed of:

— Pinion **152**, fastened on shaft **A**.

— Tabulator Brake Drum, keyed on the machine frame.

— Two Brake Shoes which can pivot on the flange **156**.

— Drive Flange and pinion **156**.

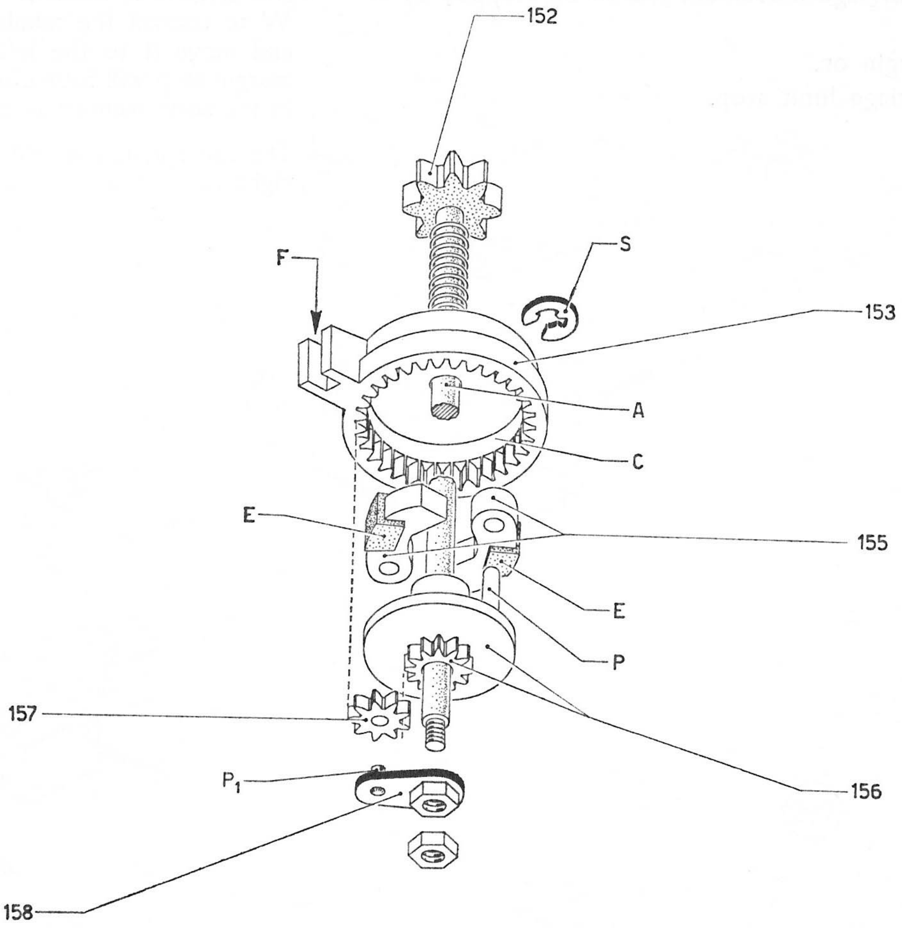
— Planetary gear **157**.

— Drive Arm **158**.

ACTIVATION

When in engagement with the rack, Pinion **152** rotates drive arm **158**, which through the planetary gear **157**, rotates the drive flange **156**. The braking action is obtained through the centrifugal force causing the brake shoes **155** to push against the drum.

226

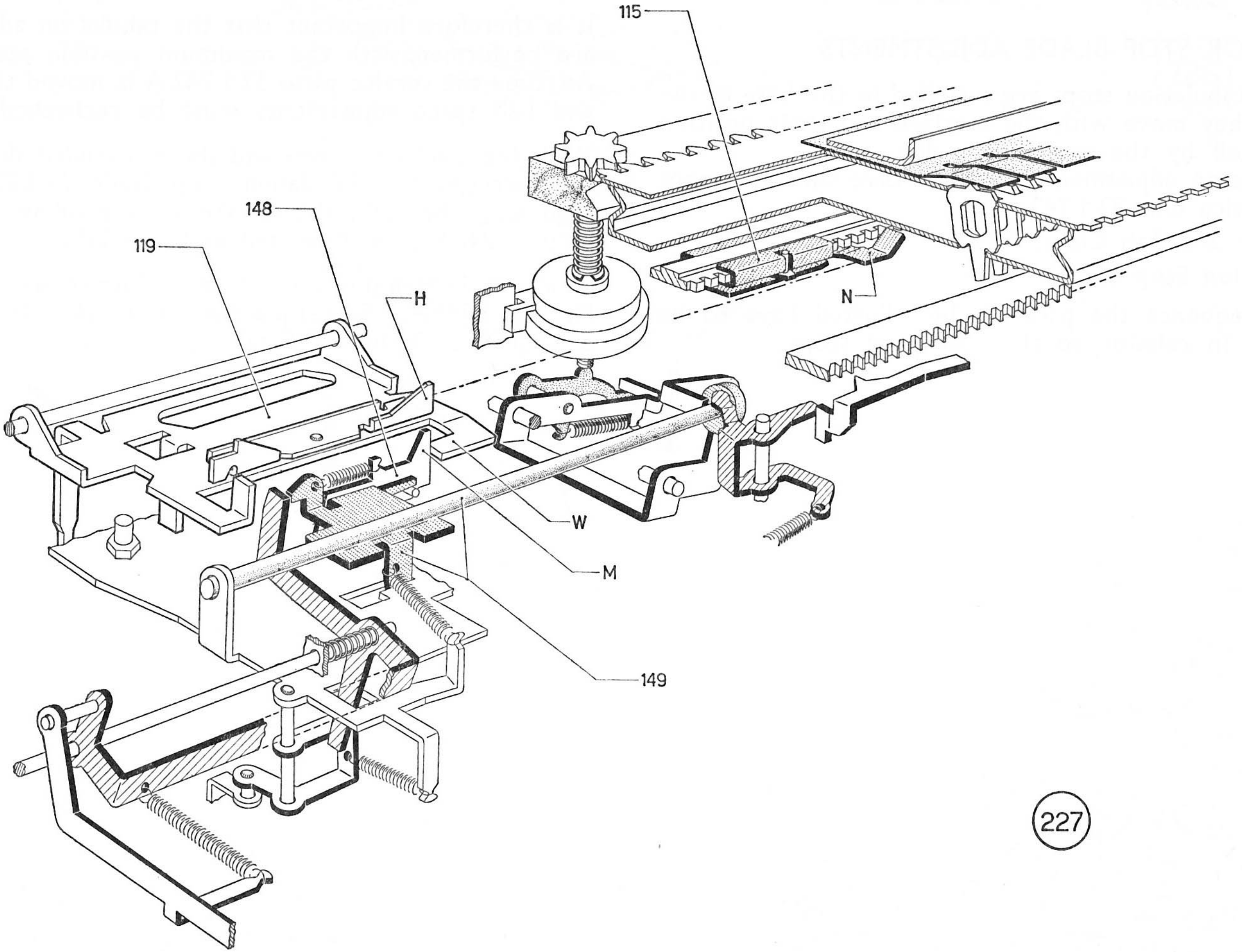


This action is obtained if the tabulator bar is depressed after the last tabulation stop.
In this case the carriage movement has to be stopped by either:

- The right margin or.
- The right carriage limit stop.

- When tabulating into the right margin stop, its wing **N** will contact extension **H** of the margin release slide **119** and drive it to the left. This movement causes extension **W** to contact the tabulation stop blade **148** at point **M** and move it to the left. As a consequence, the right margin stop will have disengaged the tabulator mechanism in the same manner as a set tab stop.

- The same action would result when tabulating into the right limit stop.



227

ADJUSTMENTS

1 - Figures 228-229

TABULATOR STOP BLADE ADJUSTMENTS

Since the tabulation stops are installed in the base of the carriage, they move with the carriage and their position is controlled by the escapement dog.

The tabulation adjustments which involve the movement of the service unit 32 1 742 A are:

- Tab Set and Tab Clear.
- Tabulation Stop Blade.

As a consequence the parts to be adjusted have to be positioned in relation to the tabulation stops.

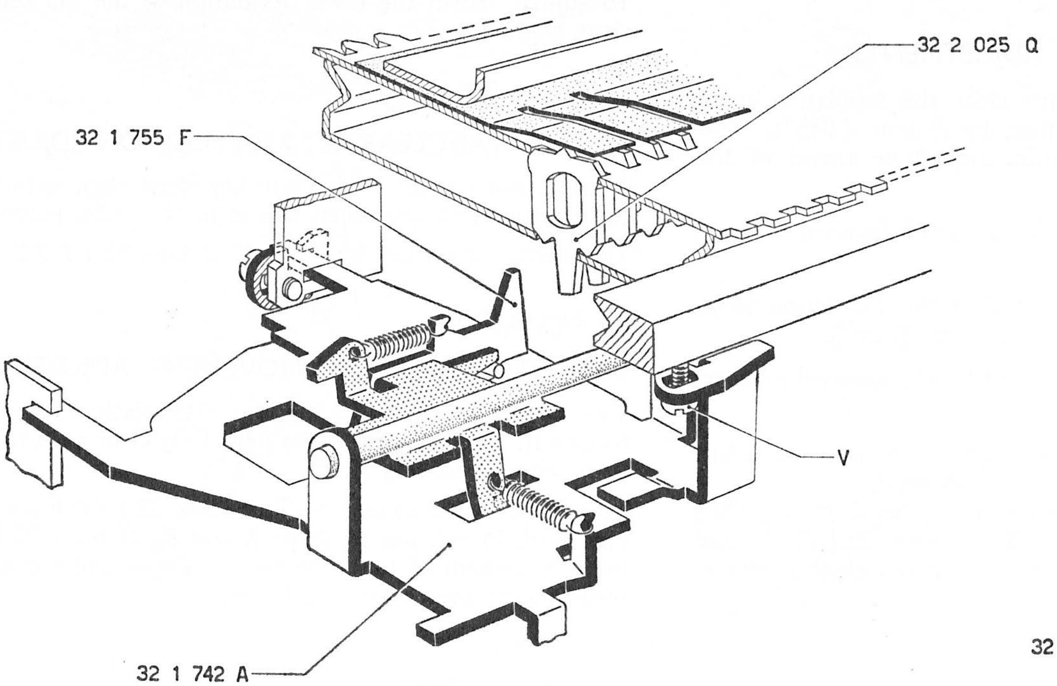
Also assembled in the same service unit are the parts which provide for margin and half space adjustments.

It is therefore important that the tabulation adjustments are performed with the maximum possible accuracy.

Anytime the service plate 32 1 742 A is moved the margin and half space adjustments must be rechecked.

With the machine at rest and the escapement dog holding the carriage, the Tabulation Stop Blade 32 1 755 F must align with the right side of the corresponding Tabulation Stop 32 2 025 Q as illustrated in figure 229.

To adjust: Loosen the two (2) screws which secure the Service Plate 32 1 742 A. Reposition the service plate left or right as required. Tighten the two (2) screws.



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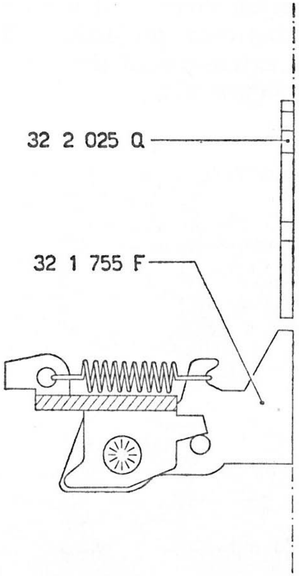


229

2 - Figures 230-231

TAB SET AND TAB CLEAR ADJUSTMENTS

At rest the tab set finger must clear the tabulation stops which are in the ***cleared*** position, by .9 mm. (.035"). This condition must exist throughout the entire travel of the carriage (figure 231).

To adjust: Form stop **A** of Plate 32 1 739 F forward or rearward as required.

At rest the Tab Clear Blade must clear the Tabulation Stops which are in the ***set*** position, by .7 mm. (.028").

To adjust: Form stop A_1 of Plate 32 1 739 F forward or rearward as required.

The full movement of the tab set finger or the tab clear when the control key is operated must be ensured.
For this reason there must not be more than .2 mm. (.008") clearance between projections **B** of lever 32 1 731 X and the lower extensions of the tab set and tab clear blades as shown in figure 231.

To adjust: Form the lower extension of the tab set or tab clear blade.

3 - Figure 230

TAB SET - TAB CLEAR KEY REST POSITION ADJUSTMENT

At rest, the tab set - tab clear key must align with the impression control key when this is in the MIN. position.

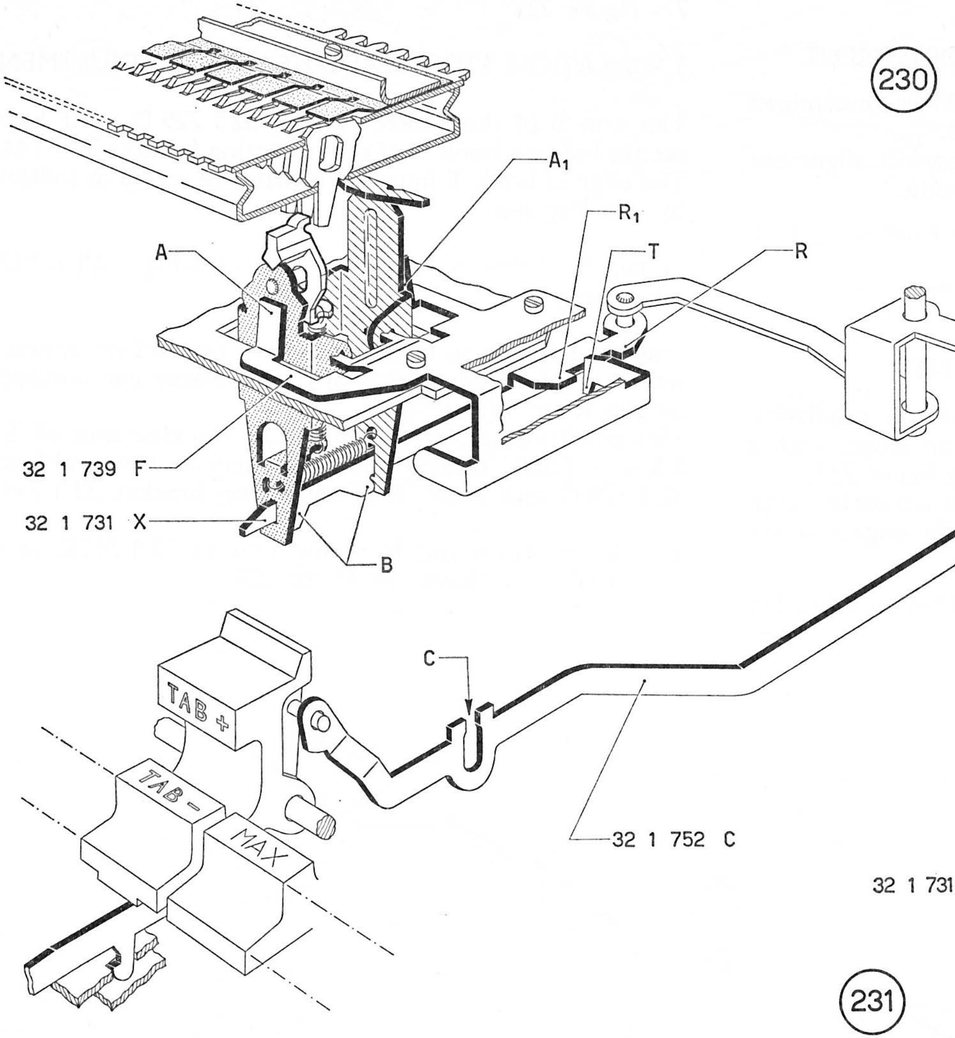
To adjust: Open or close slot **C** of Link 32 1 752 C.

4 - Figure 230

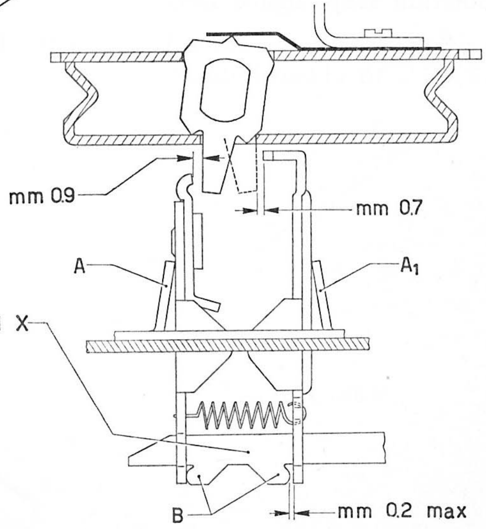
TAB SET - TAB CLEAR MOVEMENT ADJUSTMENT

The tab set finger must fully set a tabulation stop without forcing it. The tab clear blade must fully clear a set tabulation stop without forcing it.

To adjust: Form extension **T** of Plate 32 1 739 F forward or rearward, in relation to stops **R** and R_1 of lever 32 1 731 X, until movement of both the tab set finger and the tab clear blade meets the above conditions.


A₁
R₁
T
R
A
32 1 739 F
32 1 731 X
B
C
TAB +
TAB -
MAX
32 1 752 C

230


mm 0.9
mm 0.7
A
A₁
32 1 731 X
B
mm 0.2 max

231

5 - Figure 232

TABULATOR BAR REST POSITION ADJUSTMENT

The rest position tabulator bar 32 0 646 M is determined by extension **H** of the bridge 32 1 729 D.
The tabulator bar 32 0 646 M must be in perfect alignment with the adjacent feature keys on each side.

To adjust: Open or close the slot **A** of the Connecting Link 32 1 752 C.

6 - Figures 232-233-234

TABULATION STOP BLADE ADJUSTMENT

With the tabulator bar in the rest position, the tabulation stop blade **D** must clear any set tabulation stops, with a clearance of .4 to .5 mm. (.016″ to .020″) figure 233.
When the tabulator bar is depressed the tabulation stop blade **D** must raise high enough to safely engage a set tabulation stop, figure 234.

To adjust: Form the extension **K** of the Mounting Bracket 32 1 744 C to obtain both these conditions.

7 - Figure 232

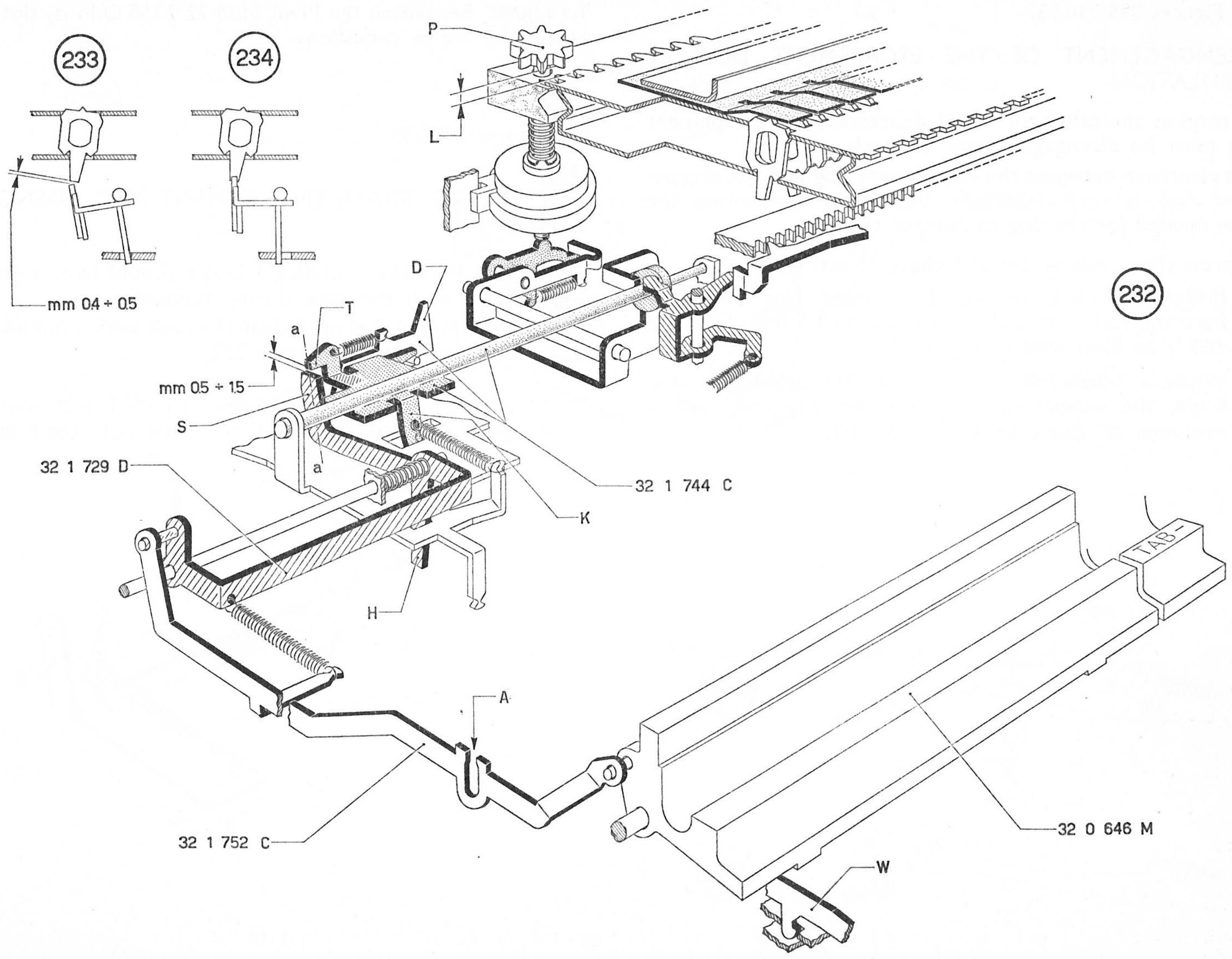
TABULATION STOP BLADE CONTROL ADJUSTMENTS

The arm **S** of the control bridge 32 1 729 D must have a secure hold on hook **T** of the mounting bracket 32 1 744 C.
The edge of hook **T** must align with the arm **S** as indicated by the line **a-a.**

To adjust: Form the arm **S** of Control Bridge 32 1 729 D as required.

The tabulation stop blade must have reached its operating position before depression of the tabulator bar is stopped by the lever **W.**
This condition is directly related to the clearance of .5 to 1.5 mm. (.020″ to .059″) between arm **S** of control bridge 32 1 729 D and hook **T** of mounting bracket 32 1 744 C.

To adjust: Form the Mounting Bracket 32 1 744 C at the hatchured area shown in figure 232.


233

234

232

mm 0.4 ÷ 0.5
P
L
D
T
a
mm 0.5 ÷ 1.5
S
a
32 1 729 D
32 1 744 C
K
H
A
32 1 752 C
32 0 646 M
TAB
W

8 - Figures 235-236-237

DISENGAGEMENT OF THE ESCAPEMENT DOG IN TABULATION

As soon as the tabulator bar is depressed, the escapement dog must be disengaged from the rack.

The clearance between the escapement dog and the escapement rack is very important, because it determines the time needed for the dog to reenter the rack.

Depress the tabulator bar and check to see that:

— Bridge 32 1 740 L releases Escapement Dog 32 1 004 T from the rack with a clearance of 1. to 1.5 mm. (.039″ to .059″) as illustrated in figure 236.

— When a tabulation stop contacts the tabulation stop blade, the escapement dog re-enters the rack with a minimum of clearance **L** (figure 237).

To adjust: Reposition the Pivot Stud 32 9 255 Q in its slot to obtain the above conditions.

9 - Figures 232-235

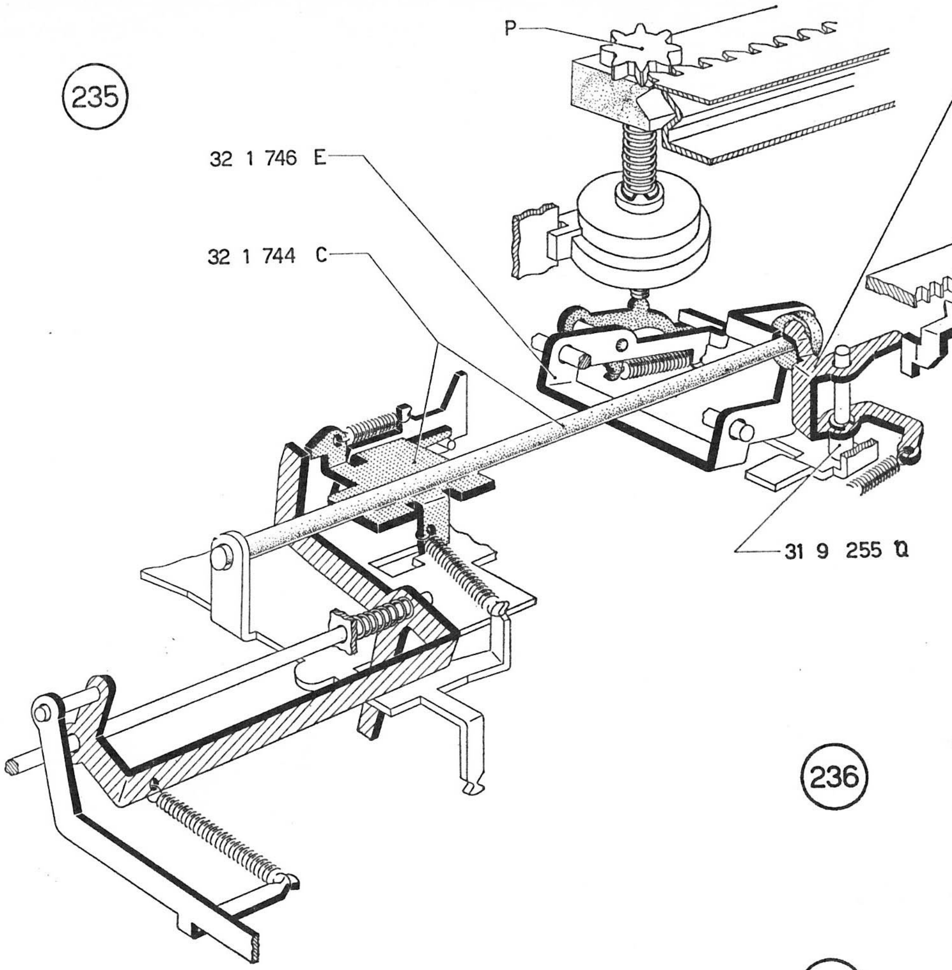
CENTRIFUGAL BRAKE ENGAGEMENT AND DISENGAGEMENT

The pinion P of the centrifugal brake should have a good engagement with the rack during tabulation.

At rest, the pinion P should clear the rack with a minimum clearance L as shown in figure 232.

To adjust: Form the wing of Bridge 32 1 746 E that contact the flange of Assembly 32 1 744 C to obtain both conditions.

235



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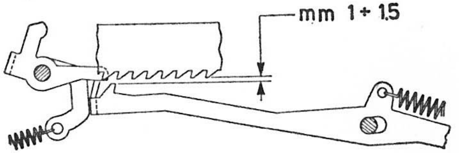

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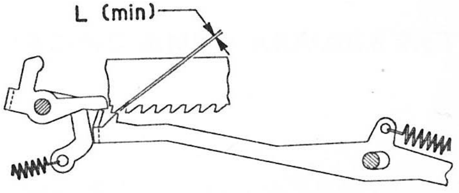


LINE SPACING AND CARRIAGE RETURN

FOREWORD

At the completion of a writing line it is necessary to:

- — Rotate the platen and paper a pre-determined amount to vertically space the writing lines as required.
- — Return the carriage to the starting position for the next line of writing.

Both of these actions are obtained by depression of either carriage return key.

LINE SPACING

Line Space is the vertical distance between lines of writing. By use of the Line Space Selector the operator can select the number of spaces between writing lines.

AUTOMATIC LINE FINDER

— The Line Space Ratchet **159** is coupled, by means of a clutch, to the left end of the platen, and is controlled by the Detent Pin **P**.
The detent pin **P** is attached to the Release Lever **160** which under the action of the spring **m**, holds the detent pin engaged with the teeth of the line space ratchet.

To type between the writing lines and then return to the original spacing pattern, it is necessary for the operator to be able to disengage and engage the detent pin when desired.

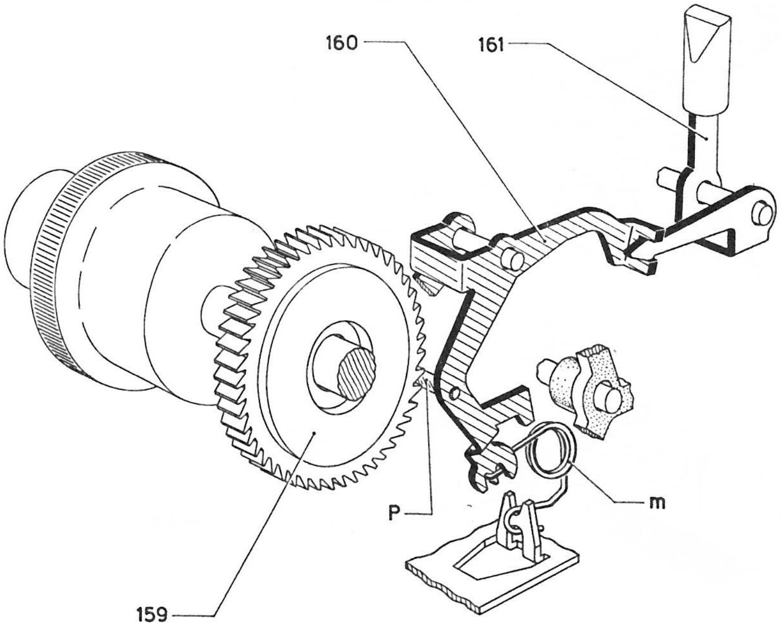
— In figure 239 the automatic Line Finder Lever **161** is forward, and the detent pin **P** is engaged with the teeth of the line space ratchet. This means that rotation of the platen will always be an exact number of teeth of the ratchet.

— When the lever **161** is pushed to the rear, as in figure 240, it rotates the release lever **160**. This rotation moves the spring over center. The force exerted by the spring will now hold lever **160** to the rear and the detent pin **P** disengaged from the ratchet.

With detent pin **P** disengaged, the platen may be rotated to any desired position. When the detent pin is re-engaged with the ratchet, line spacing will again be controlled by the Ratchet in the original spacing pattern.

— The minimum line space obtainable automatically will rotate the platen a distance equal to two teeth of the ratchet, which is setting 1. The additional settings will give 3, 4 and 5 tooth movement of the ratchet respectively.

238



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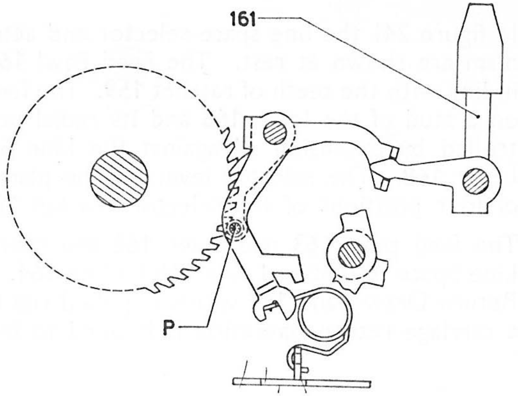

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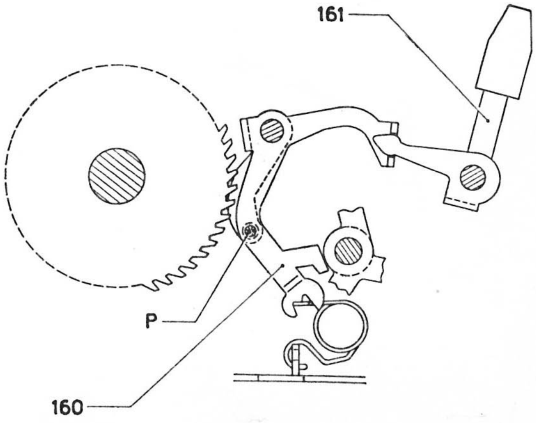


LINE SPACE SELECTOR

— In figure 241 the line space selector and actuating mechanism are shown at rest. The Feed Pawl **163** is mounted in line with the teeth of ratchet **159**. The feed pawl pivots on a stud of the lever **166** and its radial position is controlled by extension H against the Line Space Selector Lever **168**. The selector lever can be placed in any one of four positions of the selector bracket **169**.

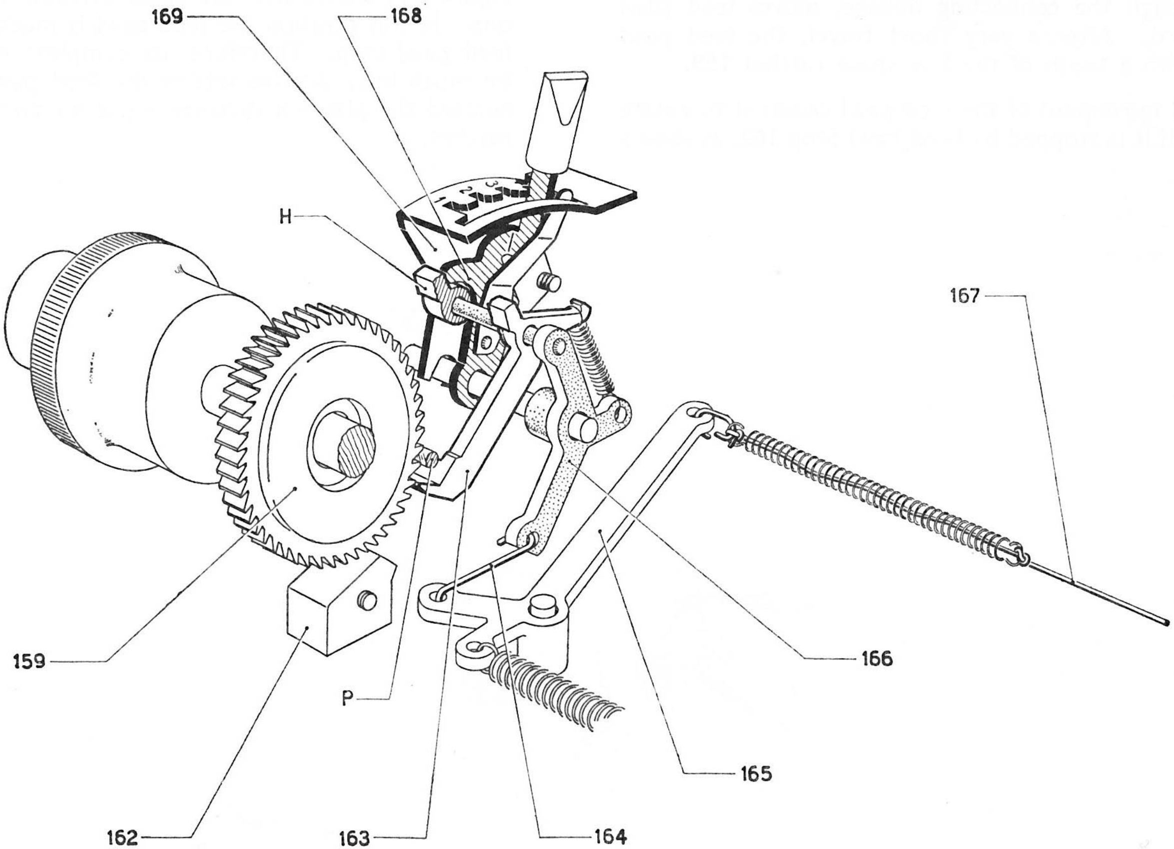
— The feed pawl **163** and lever **166** are connected to the Line Space Actuating Lever **165** by link **164**. The Carriage Return Draw Band **167** which is pulled rightwards during a carriage return operation is hooked to lever **165**.

ACTIVATION

— In order to rotate the platen for line spacing, feed pawl **163** must be moved forward; engage the teeth of the line space ratchet; rotate the line space ratchet and platen.

— The amount of movement of the feed pawl after it engages the racket determines how much the platen will rotate and how much space will be between lines in the vertical direction.

241



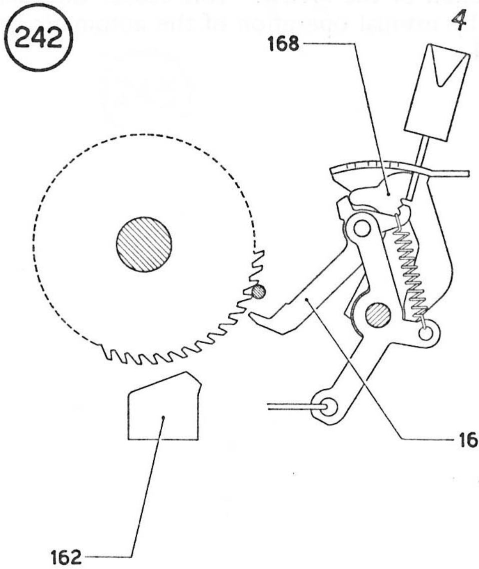
- Figures 242 and 243 illustrate the movement of the mechanism during a line space operation with the selector set at maximum.
- In figure 242 the mechanism is at rest. When the carriage return mechanism is activated, the carriage return draw band, through the connecting linkage, moves feed pawl **163** forward. After a very short travel, the feed pawl engages with a tooth of the line space ratchet **159.**

The continued movement of the feed pawl causes it to rotate the platen until it is stopped by Feed Pawl Stop **162**, as shown by the dotted outline in figure 243. In this case the ratchet and the platen have rotated a distance of five teeth.

At the completion of carriage return the mechanism restores to rest.

- Figure 244 shows the line space selector set in position one. In this position the feed pawl is much closer to the feed pawl stop. Therefore, its complete movement will be much less. At this setting the feed pawl would have rotated the platen a distance equal to two teeth of the ratchet.

242



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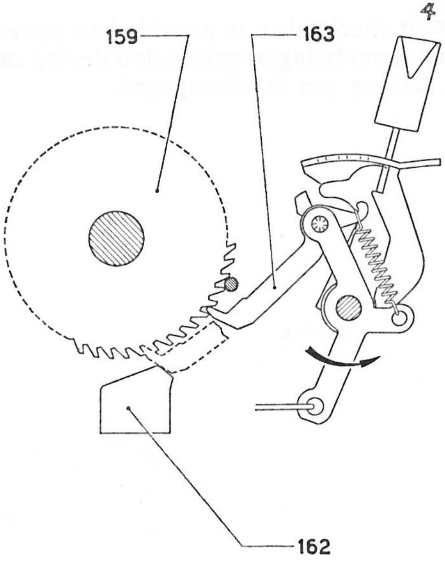

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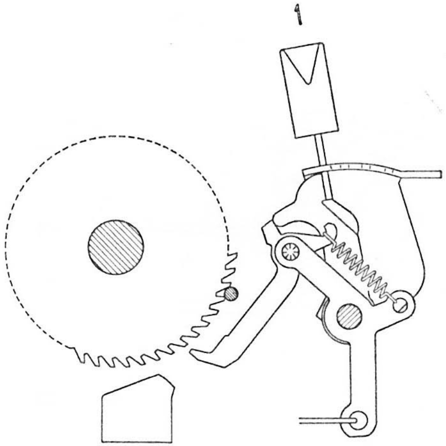
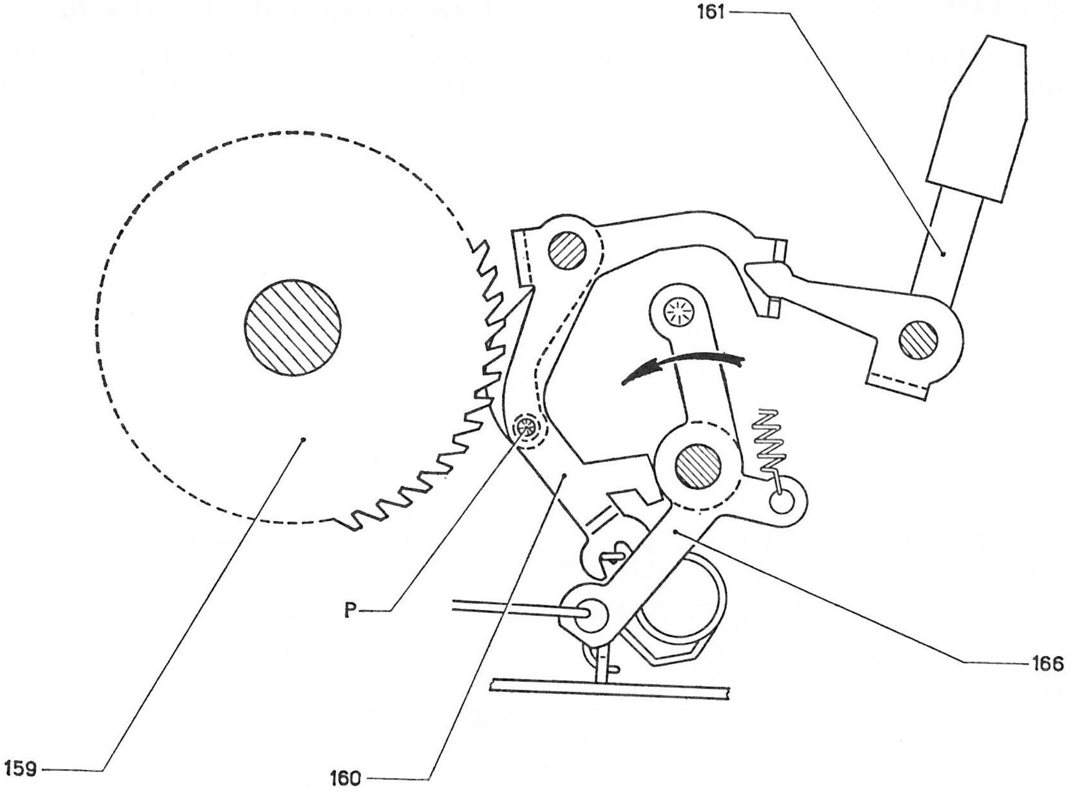


AUTOMATIC LINE FINDER RESET DURING CARRIAGE RETURN

— The reset mechanism is provided to prevent the platen rotation from being uncontrolled during carriage return, if the detent pin is disengaged.

— The carriage return operation rotates the lever **166** in the direction of the arrow. This causes the same action as given by manual operation of the automatic line finder lever **161**.

245



ADJUSTMENTS

1 - Figure 246

LINE SPACE SELECTOR ADJUSTMENTS

The Line Space Selector Bracket 32 2 318 A must be positioned to enable the Feed Pawl 32 2 309 J to enter ratchet R midway between two teeth.

To adjust: Reposition the Line Space Selector Bracket 32 2 318 A to obtain the required condition.

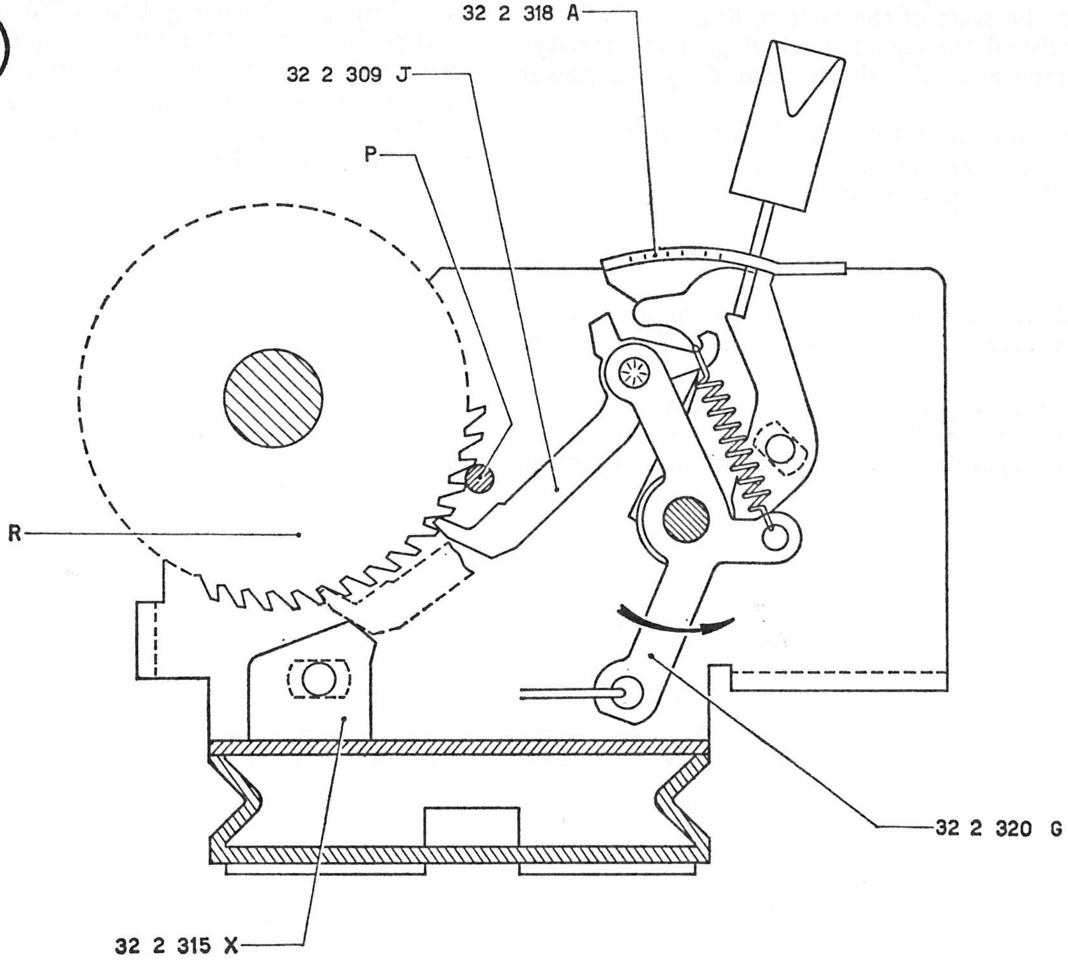
2 - Figure 246

FEED PAWL ADJUSTMENT

The line space ratchet R must be rotated 2, 3, 4 or 5 teeth depending on setting of the line space selector, and the Feed Pawl 32 2 309 J must limit against Stop 32 2 315 X. At the same time the detent pin P must securely locate between two teeth of ratchet R.

To adjust: The above conditions should be obtained by the correct positioning of the Feed Pawl Stop 32 2 315 X.

246



CARRIAGE RETURN

The function of the carriage return mechanism is to return the carriage to the start of the writing line.
This is accomplished through the winding of the carriage return draw band around a drum rotated by the power shaft.
Therefore, the carriage return mechanism must:

- Activate the carriage return drum.
- Disengage the escapement dog.

COMMAND

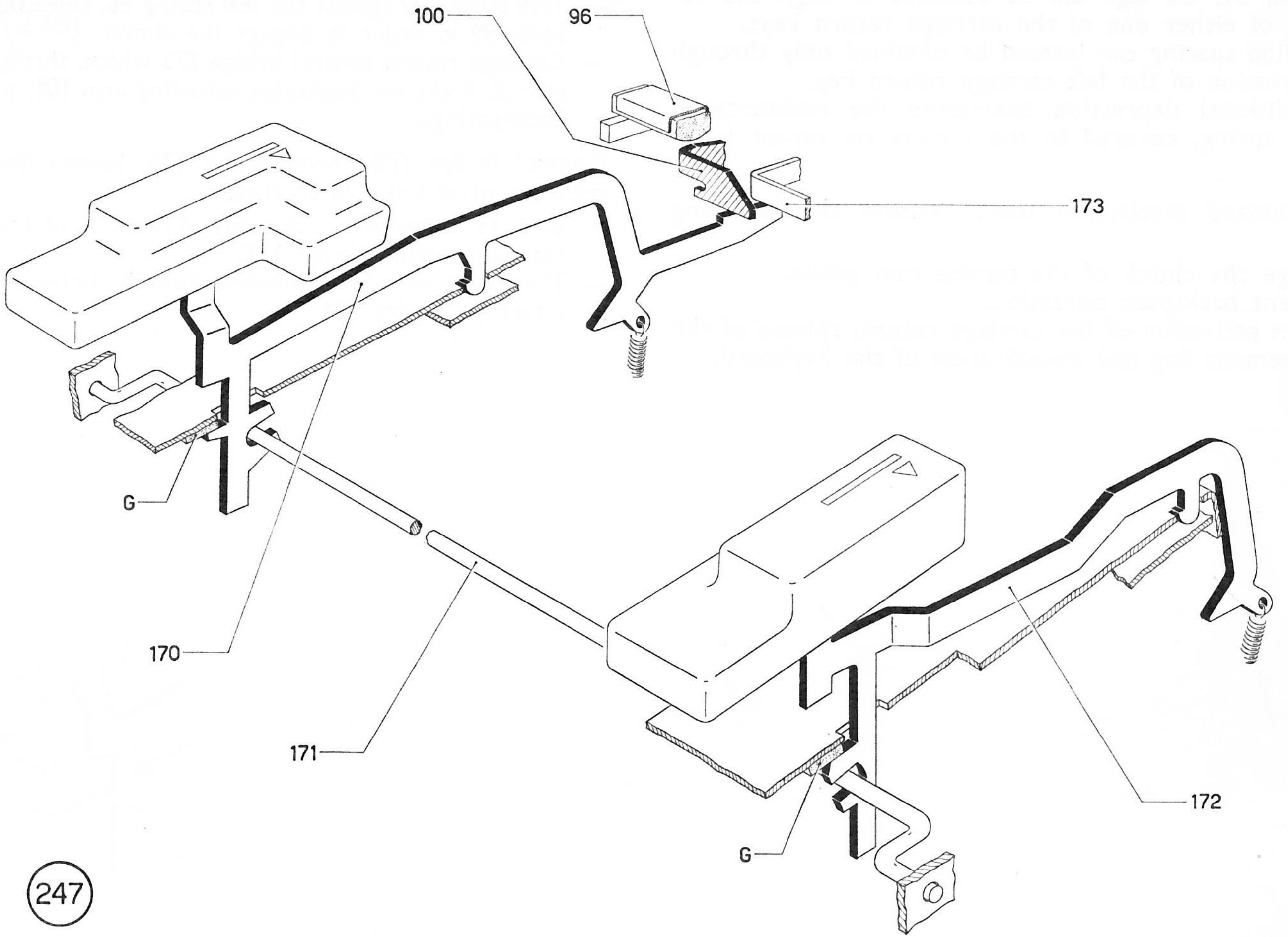
The command mechanism, operated by depression of either carriage return key, performs the following functions:

- Releases the backspace cam group clutch.
- Prevents the action of the backspace mechanism.
- Pre-sets the operation of the activation mechanism.

ASSEMBLY (REST POSITION)

The Carriage Return Key Levers **170** and **172** are held in the rest position against the rubber stop **G** through their respective springs. The two key levers are connected by the rod **171**.

The rear of the left carriage return key lever **170** is positioned under the carriage Return Control Bridge **173** and the Backspace Trip Lever **100**.



(247)

COMMAND MECHANISM ACTIVATION

Return of the carriage can be obtained through the depression of either one of the carriage return keys.
Repeat line spacing can instead be obtained only through full depression of the left carriage return key.
This additional depression overcomes the resistance of the leaf spring, covered in the section on repeat backspacing.

The command mechanism must perform the following actions:

- Engage the clutch of the service cam group.
- Prevent backspace operation.
- Preset activation of the carriage return, release of the escapement dog and de-activation of the keyboard.

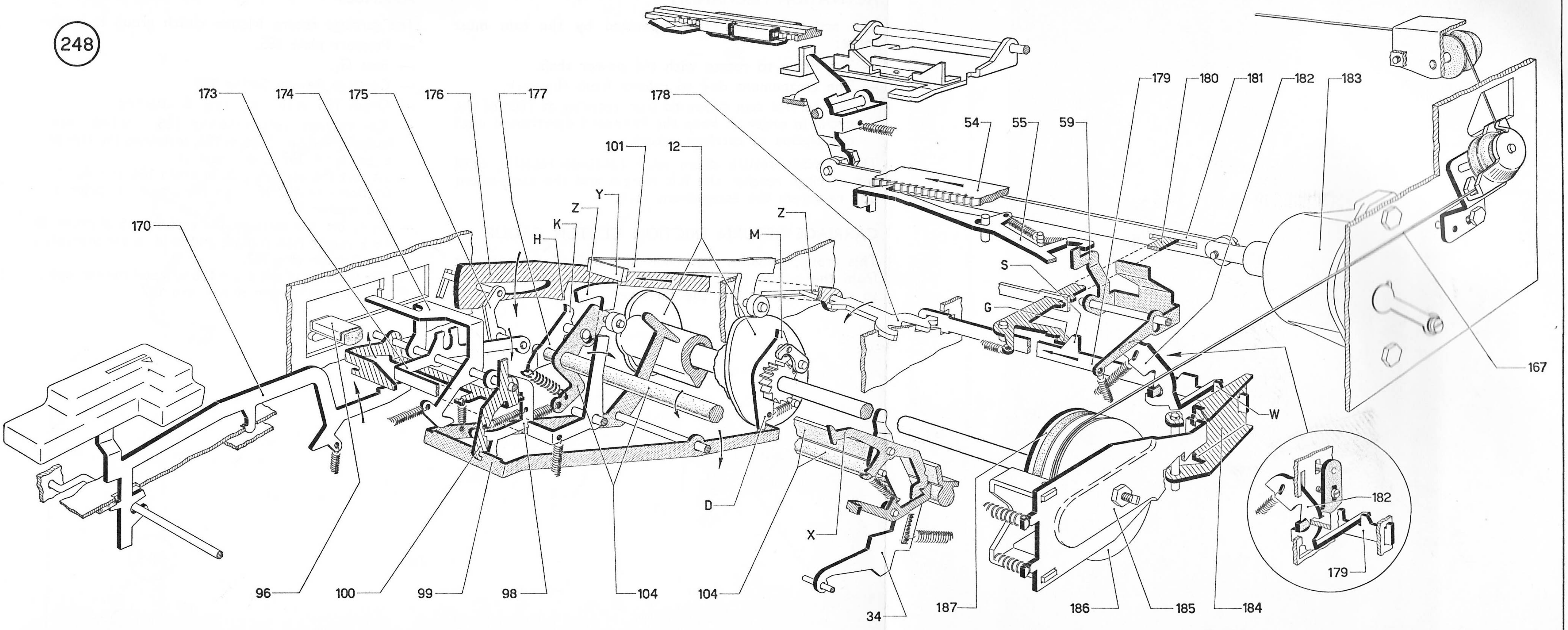
During normal depression, the carriage return key lever **170** will rotate:

- Trip lever **100** against the leaf spring **96**, releasing starting lever **99** in order to engage the clutch.
- Carriage return control bridge **173** which, through extension Z, locks the backspace actuating arm **101**, preventing backspacing.

Control Bridge **173**, through link **175**, lowers the carriage return control link **176** so that:

- Step H is positioned in front of hook K of the carriage return actuating lever **177**.
- The front end is positioned directly behind the cycle interrupt bridge **174**.

248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W
X
D

ACTIVATION MECHANISM

The activation mechanism operated by the cam must cause:

- The drum to rotate with the power shaft.
- The escapement dog to release from the rack.
- The service cam group to stop rotating at 180° of the cycle, in order to keep the keyboard deactivated until completion of carriage return.

The carriage return drum must continue rotating until the carriage reaches the left margin and the escapement dog re-enters the escapement rack.

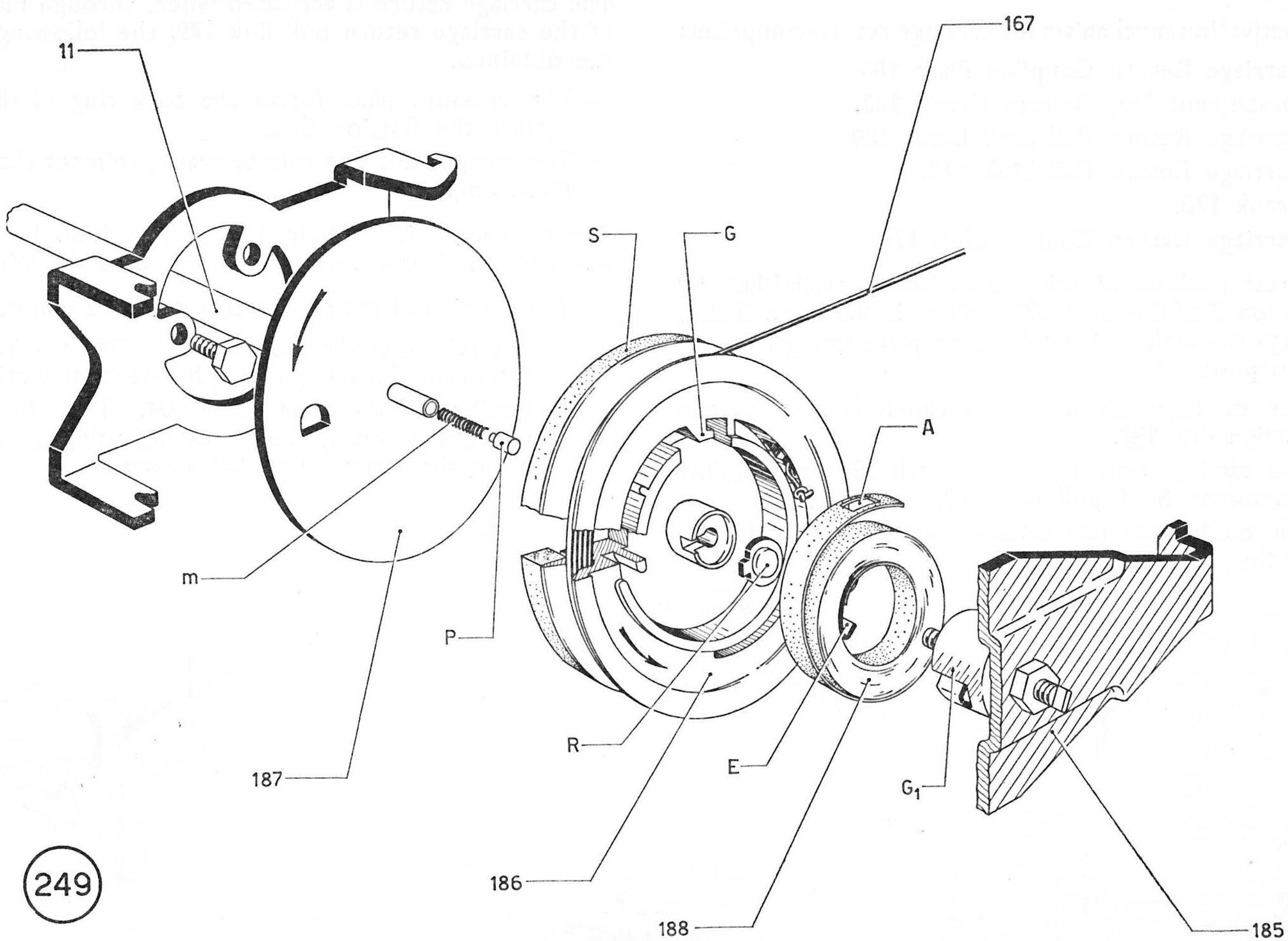
CARRIAGE RETURN FRICTION CLUTCH GROUP

This group, provides the means of transferring movement from the power shaft to the carriage return draw band so that it can return the carriage.

ASSEMBLY

The carriage return friction clutch group is composed of:

- Pressure plate **185**.
- Boss G_1.
- Carriage Return Spring **188**.
- Drum **186** with cork ring **S** attached.
- The carriage return spring **188**, hooked between the boss G_1 and lip of Drum **186**, maintains the carriage return draw band **167** under tension.
- At rest the cork ring **S**, of drum **186**, is held clear of the friction disc **187** through the action of spring **m**, pin **P**, and washer **R**.
- To return the carriage, the cork ring **S** of drum **186** must be brought into contact and held under pressure against the friction disc **187**.
  The rotation of the drum **186** will pull the carriage through the carriage return draw band **167**.



249

ACTIVATION MECHANISM - ASSEMBLY (REST POSITION)

— The activation mechanism for carriage return comprises:

- — Carriage Return Coupling Plate **184**.
- — Escapement Dog Release Crank **182**.
- — Carriage Return Pull Link Latch **180**.
- — Carriage Return Pull Link **179**.
- — Crank **178**.
- — Carriage Return Control Link **176**.

— The rest position of this mechanism is established by extension Z of the crank **178** limiting in the sidewall slot, through the action of the pressure plate springs.
In this position:

- — The carriage return friction clutch is clear of the friction disc **187**.
- — The carriage return pull link latch **180** rests against extensions S of pull link **179**.
- — The escapement dog release crank **182** is held clear of the escapement plate **59**.

ACTIVATION

The carriage return is activated when, through movement of the carriage return pull link **179**, the following actions are obtained:

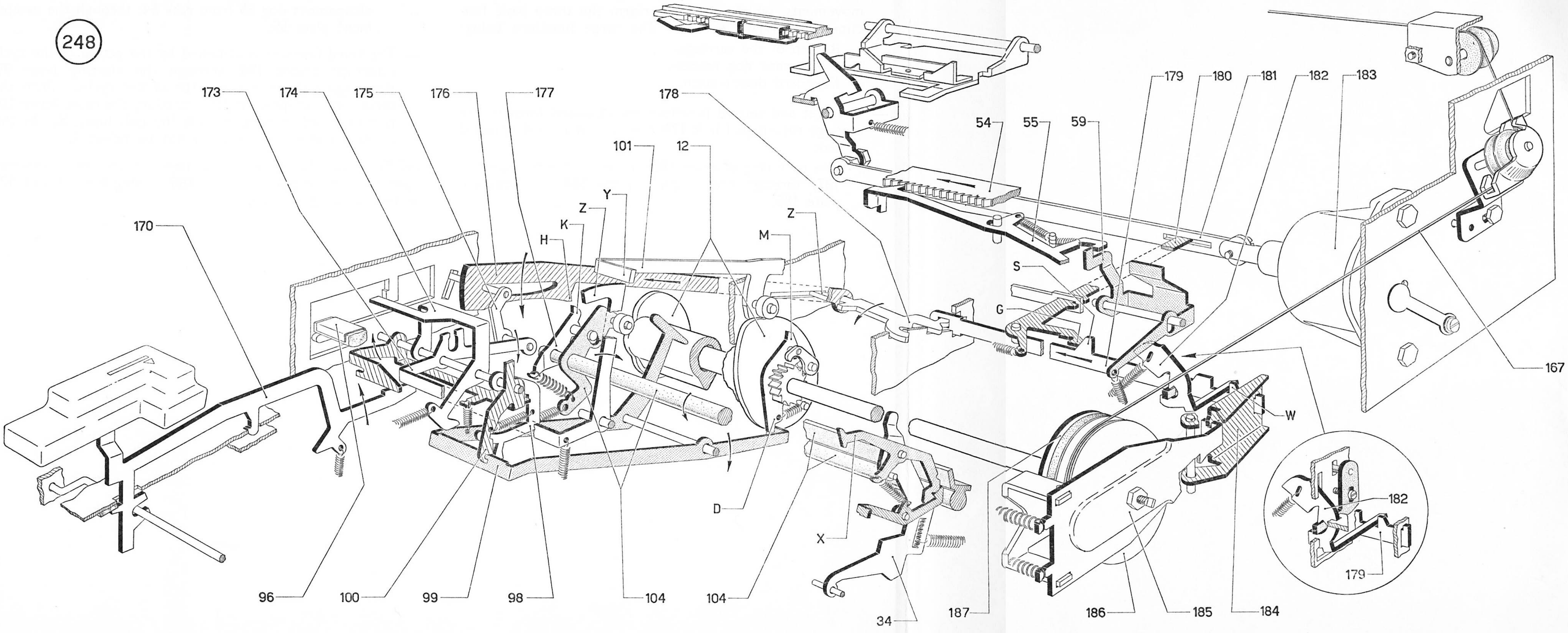
- — The pressure plate forces the cork ring of the drum against the friction disc.
- — The escapement dog release crank, releases the escapement dog.

The mechanism is maintained in this position by the pull link latch, until the carriage is returned to the left margin.

— The rotation of the service cam group **12** will cause:

- — The release of the backspace actuating arm **101**. This is prevented from operating by the control bridge **173**.
- — Rotation of the reset frame **104**. This, through the connecting spring, causes the activating lever **177** to move the control link **176** forward.

(248)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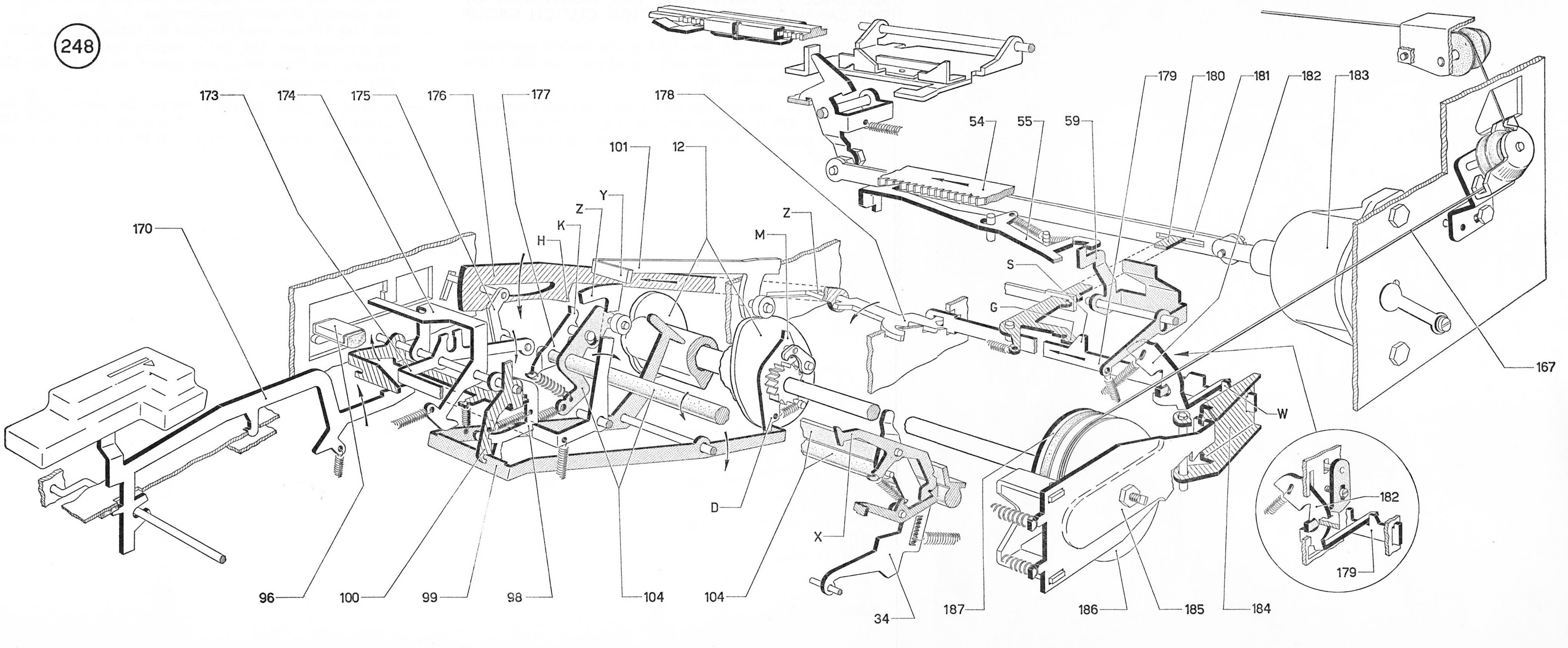
X

- The forward movement of control link **176** causes two movements, which in turn perform the three basic functions of carriage return. The three functions being:
  - Return of the carriage.
  - Escapement dog release.
  - Keyboard deactivation.
- The first and second functions are obtained through the carriage return pull link **179**, which as it moved leftward caused:
  - The cork ring of drum **186** to contact the friction disc **187**, through the coupling plate **184** and pressure plate **185**.
  - The escapement dog release crank **182** to release the escapement dog **55** from rack **54**, through the escapement plate **59**.
- The third function is obtained by the action of the cycle interrupt bridge **174**, through the starting lever **99**, disengaging the clutch at 180° of the cycle. With the service cam stopped at 180° rotation, the reset frame **104** is maintained in contact with the pull links **X**. In this condition the pull links can not be released.

NOTE - The functions of carriage return are maintained operative by the pull link latch **180** holding the pull link **179** in the working position.

248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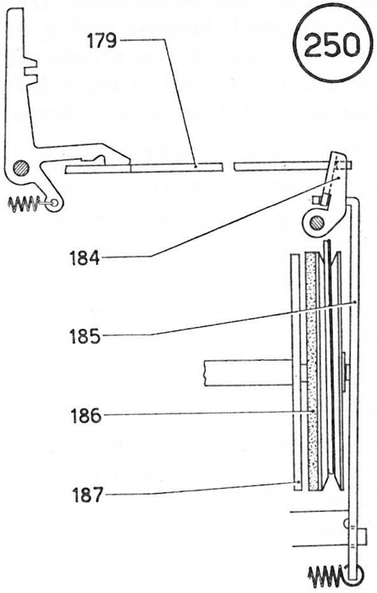
SEQUENCE OF MOVEMENTS FOR ACTIVATION OF THE CARRIAGE RETURN FRICTION CLUTCH GROUP

— Figure 250 illustrates the clutch group control mechanism in the rest position. The cork ring of the drum **186** is clear of the friction disc **187**.

— In figure 251 the carriage return cycle has been activated. Pull link **179** is moved leftward, causing plates **184** and **185** to move the drum **186** into contact with the friction disc **187**.

— In figure 252 the clutch group control mechanism is in the position of maximum command.
Pull Link **179** has moved beyond the latching point, pivoting pressure plate **185**, and stretching the springs **m**. As a result, the drum **186** is held against the friction disc **187** with the maximum pressure.

— In being stopped at 180° rotation, the service cam has passed beyond its high point. This allows pull link **179** to return rightward slightly until held by the pull link latch **180**.



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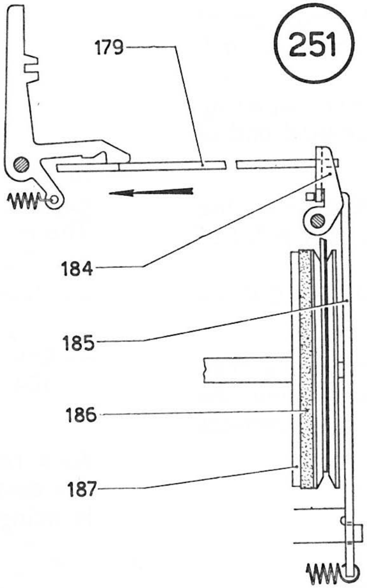

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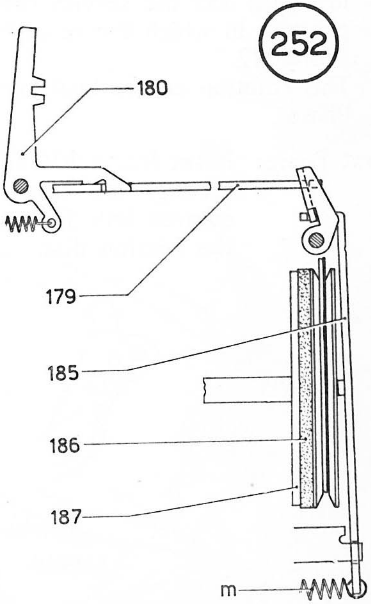


252

DETAILED MOVEMENT OF THE CONTROL LINK ACTUATING MECHANISM

— Figure 253 illustrates the mechanism immediately after depression of a carriage return key. The flange **D** has just been released by starting lever **99** and the service cam group is about to rotate.

— Figure 254 shows the mechanism during the initial rotation of the service cam group **12.** Reset frame **104** pulls lever **177** through spring **m.** The forward movement of control link **176** does not yet cause the pull link to stretch the pressure plate springs.
Reset frame **104** and lever **177** will maintain the relationship shown in the figure, with the stud at the forward end of the slot.

— In figure 255 the service cam group has rotated to the position in which the reset frame is at the high point of profile **12.**
This rotation can be broken down in the following three Phases.

First Phase: Reset frame **104** and lever **177** move together through the action of spring **m,** pushing the control link **176** until the cork ring contacts the friction disc.

Second Phase: Reset frame **104** moves while lever **177** and control link are stopped, because spring **m** can not overcome the action of the pressure plate springs. As a result, the stud of lever **177** will contact the rear of the slot in the reset frame **104.**

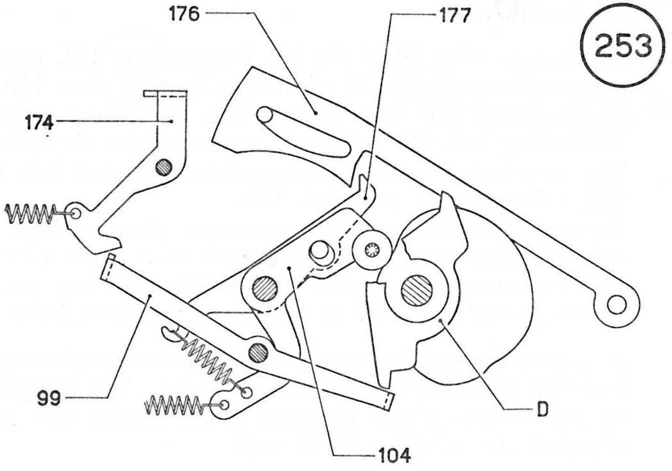
Third Phase: Reset frame **104** and lever **177** move link **176** through direct action of the stud, causing:

- — The stretching of the pressure plate springs and the full engagement of the cork ring with the friction disc.
- — The pivoting of the cycle interrupt bridge which holds the starting lever in the path of flange **D.**

— In figure 256 the service cam group is shown after disengagement from the power shaft at 180° rotation.
The movements of the carriage return mechanism during this last phase have been as follows:

- — Reset frame **104,** following the decreasing profile of the cam, has moved slightly back.
- — Lever **177** has followed the movement of reset frame **104,** only until the pull link **179** (figure 252) has been locked in its working condition.

As a result, the stud of lever **177** is now positioned in the center of the slot of reset frame **104,** and the carriage is being returned.



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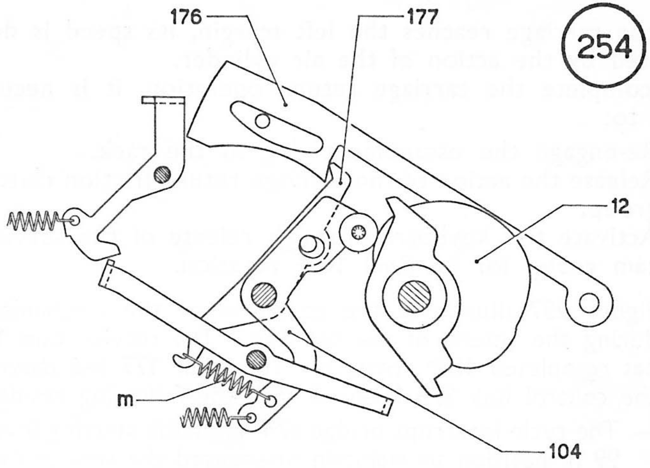

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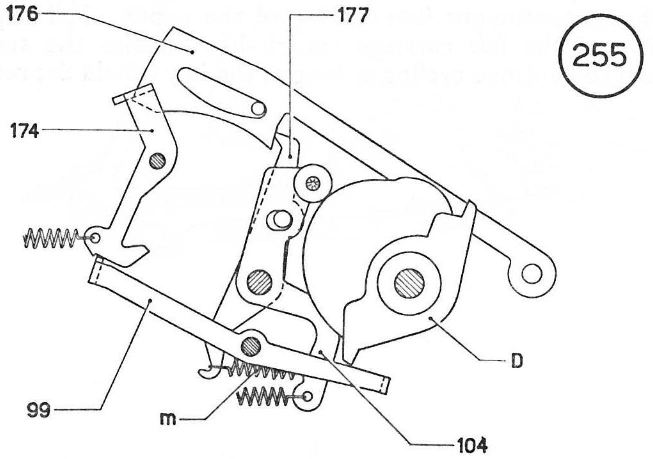
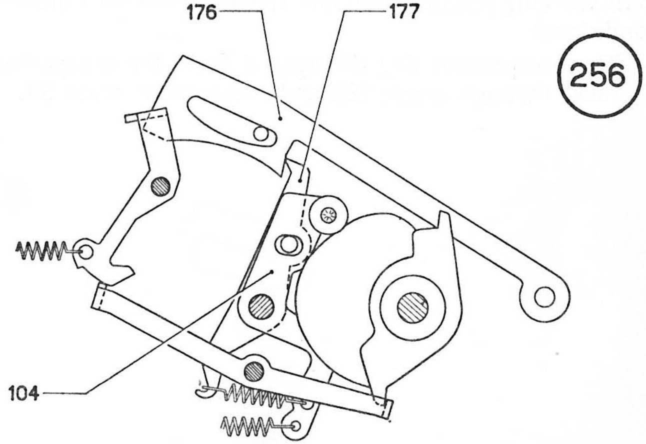


255



256

RELEASE OF THE CARRIAGE RETURN MECHANISM

As the carriage reaches the left margin, its speed is decreased by the action of the air cylinder.
To complete the carriage return operation, it is necessary to:

- **Re-engage the escapement dog in the rack.**
- **Release the action of the carriage return friction clutch group.**
- **Activate the keyboard through release of the service cam group for its final 180° rotation.**

- Figure 257 illustrates the condition of the mechanism during the return of the carriage. The service cam **12** has completed 180° rotation. The lever **177** has moved the control link **176** forward with the following results:
  - The cycle interrupt bridge **174** holds the starting lever **99** in position to maintain disengaged the service cam clutch.
  - The pull link **179** is held by the pull link latch **180.**

  In its working position, pull link **179** maintains the following conditions:
  - The escapement dog disengaged from the escapement rack, through crank **182** and escapement plate **59.**
  - Maximum pressure between the drum **186** and friction disc **187.**

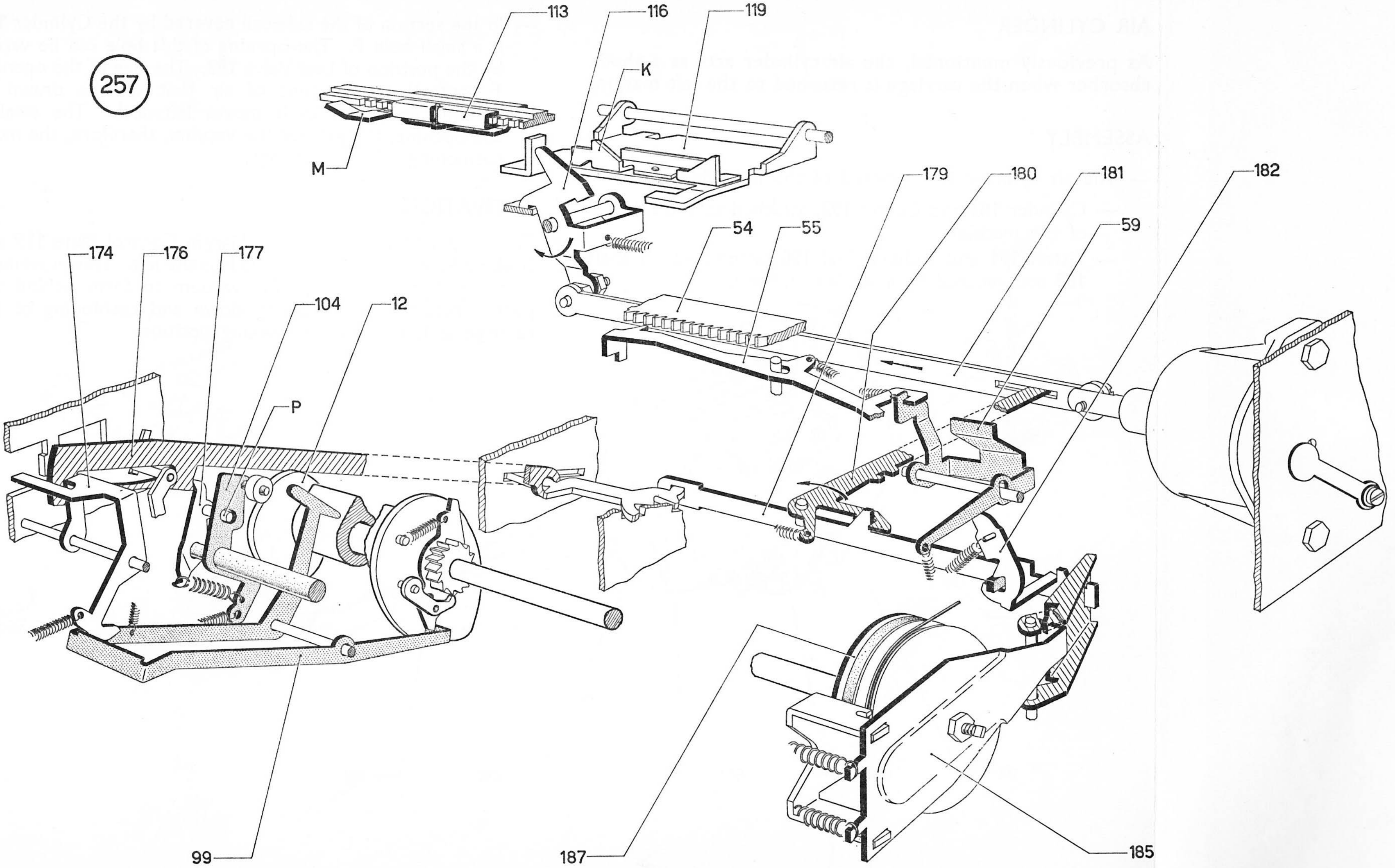
- As soon as wing **M** of the left margin stop **113**, contacts and pushes extension **K** of margin control plate **119**, the banking stop **116** will rotate. This movement pulls the connecting link **181** leftward, actuating the air cylinder. The connecting link **181** also rotates the pull link latch **180**, releasing the pull link **179.**
  Through the action of the pressure plate springs, pull link **179** and control link **176** restore a short distance. This movement is possible due to the midway position of the stud of lever **177** in the slot of the reset frame **104.**

  As a result, cycle interrupt bridge **174** releases the starting lever **99**, allowing the clutch to engage. The completion of the remaining 180° rotation of the service cam group restores the mechanism to rest.

REPEAT LINE SPACING

The repeat line spacing feature enables the operator to obtain continuous line spacing of the paper. Full depression of the left carriage return key enables the service cam to continue cycling as long as the key is held depressed.

(257)


K
M
P

AIR CYLINDER

As previously mentioned, the air cylinder acts as a shock absorber when the carriage is returned to the left margin.

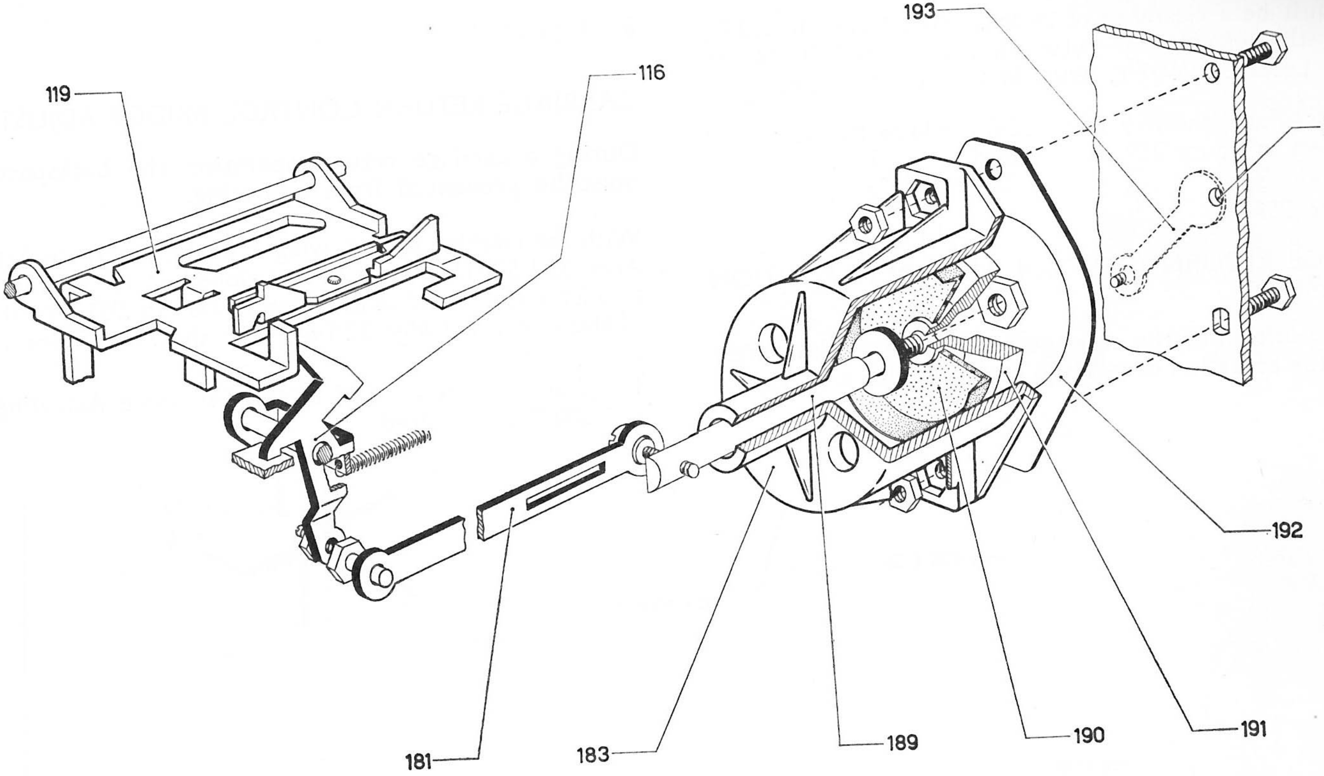
ASSEMBLY

- The air cylinder is composed of the following parts:
    - Cylinder **183** and Gasket **192**, attached to the sidewall of the machine.
    - Piston **191** and Rubber Seal **190**, assembled on shaft **189** and secured by a washer and nut.
- In the section of the sidewall covered by the Cylinder **183** is a small hole **F**. The opening of this hole can be varied by the position of Leaf Valve **193**. The size of the opening **F** controls the amount of air that can be drawn in behind the piston as it moves leftward. The smaller the opening, the greater the vacuum, therefore, the more cushioning of the Carriage.

ACTIVATION

The Margin Stop, through the Margin Control Plate **119** and Banking Stop **116**, pulls Piston **191** to the left. This movement of the piston causes a partial vacuum to form behind the piston, resulting in a slowing down and cushioning of the carriage as it reaches the banking position.

(258)



ADJUSTMENTS

1 - Figure 259

CARRIAGE RETURN KEY LEVER REST POSITION ADJUSTMENT

The carriage return key levers must control the service cam clutch in the same manner as the backspace key.

There must be a clearance of .4 to .6 mm. (.016″ to .024″) between the left carriage return key lever 32 0 719 N and the Trip Lever 32 1 507 Y, when in the rest position.

To adjust: Form the Key Lever 32 0 719 N at the hatchured area shown in figure 259, as required.

2 - Figure 259

CARRIAGE RETURN CONTROL LINK REST POSITION ADJUSTMENT

The rest position of the carriage return control link must prevent the actuation of carriage return during a backspace cycle.

In the rest position, the Control Link 32 1 642 E should clear the hook **L** of Assembly 32 1 223 S by .3 to .5 mm. (.012″ to .020″).

To adjust: Open or close the **U** shaped opening of Control Bridge 32 1 617 V as required.

3 - Figures 259-260

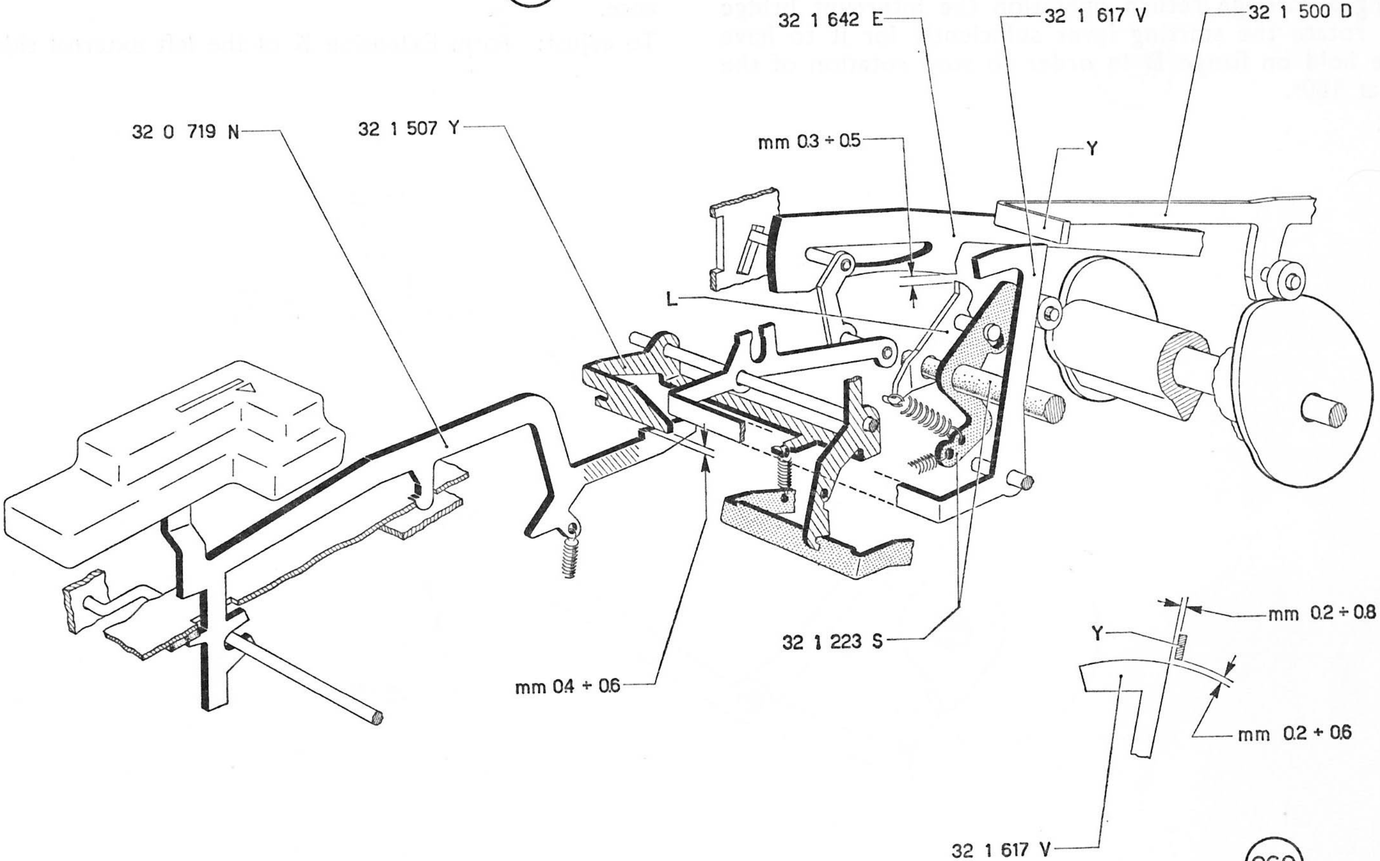
CARRIAGE RETURN CONTROL BRIDGE ADJUSTMENT

During a carriage return operation the backspace pawl must be prevented from operating.

With the machine at rest, wing **Y** of the Backspace Actuating Arm 32 1 500 D should be positioned .2 to .6 mm. (.008″ to .024″) above, and .2 to .8 mm. (.008″ to .031″) to the rear of the Control Bridge 32 1 617 V as shown in figure 260.

To adjust: Form wing **Y** of the Backspace Actuating Arm 32 1 500 D as required.

259


32 1 642 E
32 1 617 V
32 1 500 D
32 0 719 N
32 1 507 Y
mm 0.3 ÷ 0.5
Y
L
32 1 223 S
mm 0.4 ÷ 0.6
mm 0.2 ÷ 0.8
Y
mm 0.2 ÷ 0.6
32 1 617 V

260

4 - Figure 261

CYCLE INTERRUPT BRIDGE REST POSITION ADJUSTMENT

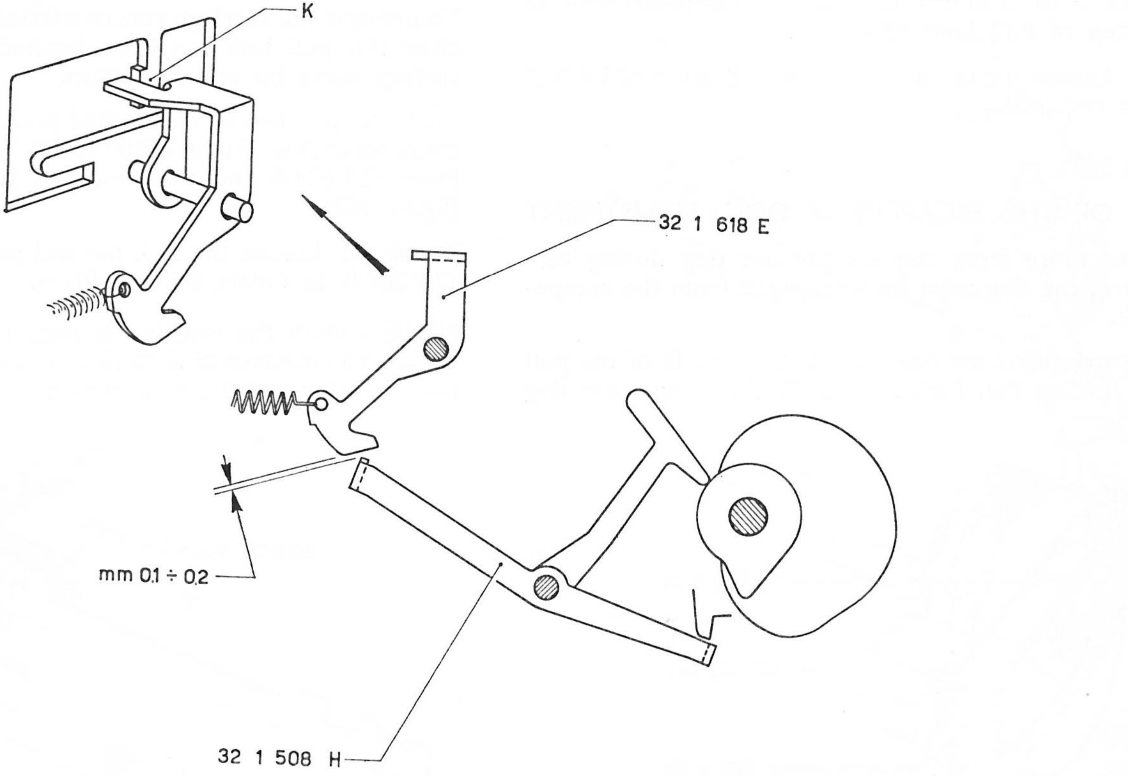
During a carriage return operation the interrupt bridge must rotate the starting lever sufficiently for it to have a safe hold on flange **D** in order to stop rotation of the cam at 180°.

With the Starting Lever 32 1 508 H released and the Interrupt Bridge 32 1 618 ***E not*** in operation, there should be a clearance of .1 to .2 mm. (.004" to .008") as shown in figure 261.

To check, depress the Backspace Key and observe the clearance.

To adjust: Form Extension **K** of the left external sidewall.

261



5 - Figure 262

CARRIAGE RETURN PULL LINK LATCH ADJUSTMENT

During carriage return operation, the carriage return pull link must be safely held in working condition.

When the Carriage Return Pull Link 32 1 623 T reaches its maximum leftward travel (figure 262) there must be a clearance of .3 to .5 mm. (.012″ to .020″) between hook **D** and the step of Pull Link 32 1 623 T.

To adjust: Loosen the screws and position Bracket 32 1 621 Z laterally as required.

6 - Figure 263

RELEASE OF THE ESCAPEMENT DOG ADJUSTMENT

To prevent noise from the escapement dog during carriage return, the dog must be disengaged from the escapement rack.

During a carriage return operation with hook **D** of the pull link latch holding Pull Link 32 1 623 T, the escapement dog must clear the escapement rack teeth by .3 to .6 mm. (.012″ to .024″).

To adjust: Raise or lower Plate 32 1 631 T.

7 - Figure 263

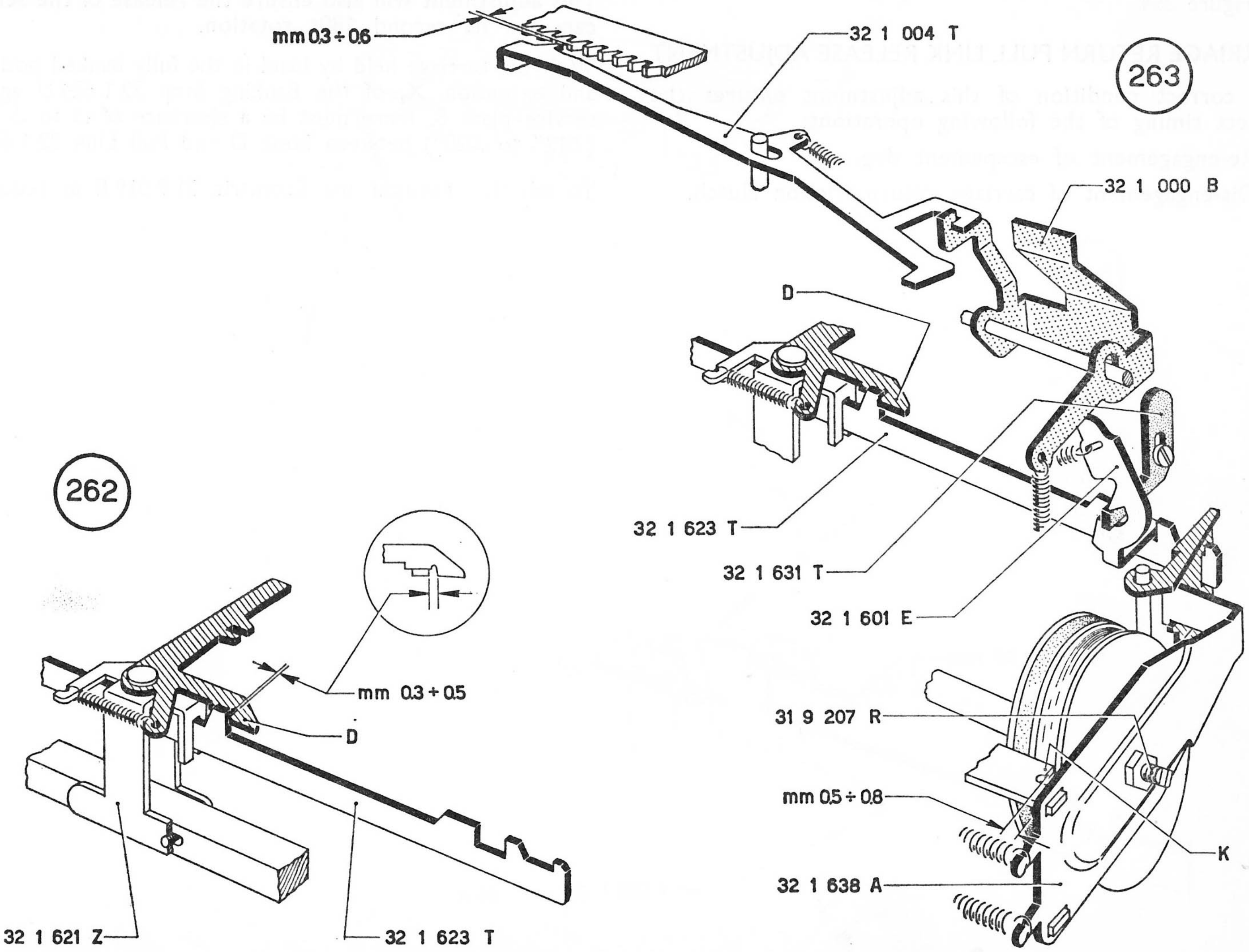
PRESSURE PLATE ACTIVE POSITION ADJUSTMENT

To prevent the carriage return friction clutch from slippign after the pull link has been latched, the pressure plate springs must be under tension.

With the pull link in the latched position, there should be a clearance of .5 to .8 mm. (.020″ to .031″) between the Pressure Plate 32 1 638 A and the shoulders **K** of its support arms (figure 263).

To adjust: Loosen the lock nut and position adjusting screw 32 9 207 R to obtain this condition.

NOTE - With the machine at rest, this adjustment should result in a clearance of .2 to .3 mm. (.008″ to .012″) between the cork ring and the friction disc.


mm 0,3 ÷ 0,6
32 1 004 T
263
32 1 000 B
D
32 1 623 T
32 1 631 T
32 1 601 E
31 9 207 R
mm 0,5 ÷ 0,8
K
32 1 638 A
262
mm 0,3 ÷ 0,5
D
32 1 621 Z
32 1 623 T

8 - Figure 264

CARRIAGE RETURN PULL LINK RELEASE ADJUSTMENT

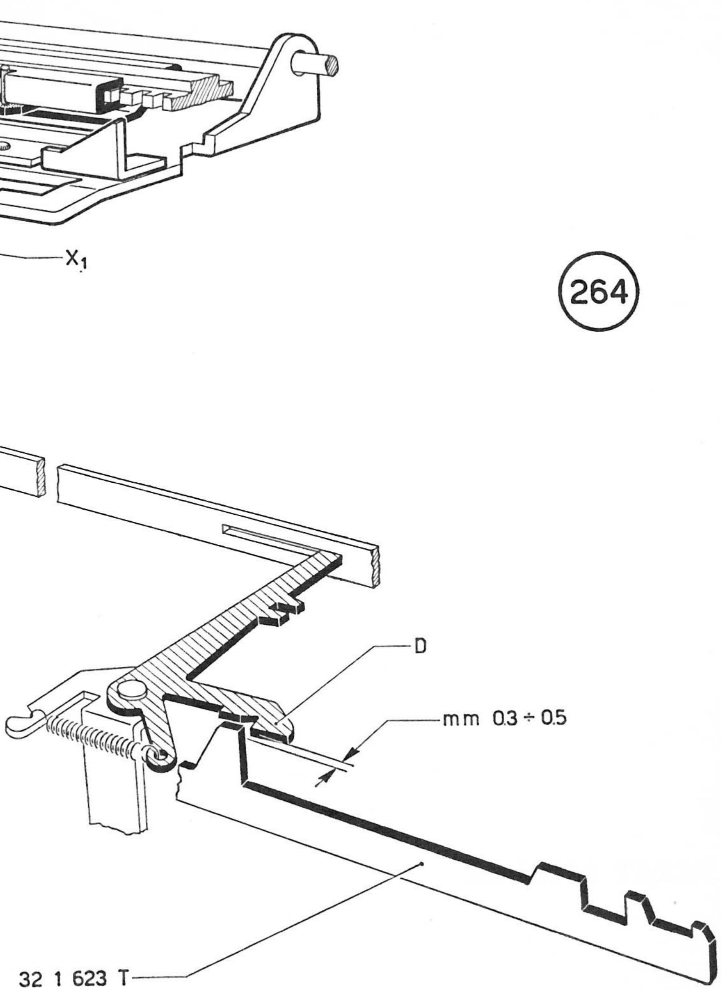
The correct condition of this adjustment ensures the correct timing of the following operations:

- **Re-engagement of escapement dog.**
- **Dis-engagement of carriage return friction clutch.**

This adjustment will also ensure the release of the service cam for its second 180° rotation.

With the carriage held by hand in the fully banked position, and extension X_1 of the Banking Stop 32 1 624 U against service plate **S**, there must be a clearance of .3 to .5 mm. (.012″ to .020″) between hook **D** and Pull Link 32 1 623 T.

To adjust: Position the Eccentric 31 9 019 E as required.


264
32 1 624 U
X$_1$
S
31 9 019 E
32 1 625 V
D
mm 0.3 ÷ 0.5
32 1 623 T

REVERSE TABULATION

REVERSE TABULATION

The Praxis 48 enables the operator to tabulate during the return of the carriage. Depression of the tabulator bar during a carriage return operation will result in immediate tabulation.

— During a carriage return operation the carriage return pull link **179** is held in the " working position " by its latch **180** (figure 265).

— If the tabulator bar is depressed with the machine in this condition, bridge **147** activates the tabulator mechanism. At the same time, its lower arm rotates bridge **146** which pulls release link **194** to the left.

Link **194** moving to the left pivots pull link latch **180**, causing it to release the carriage return pull link **179**, allowing the carriage return mechanism to restore in the normal manner.

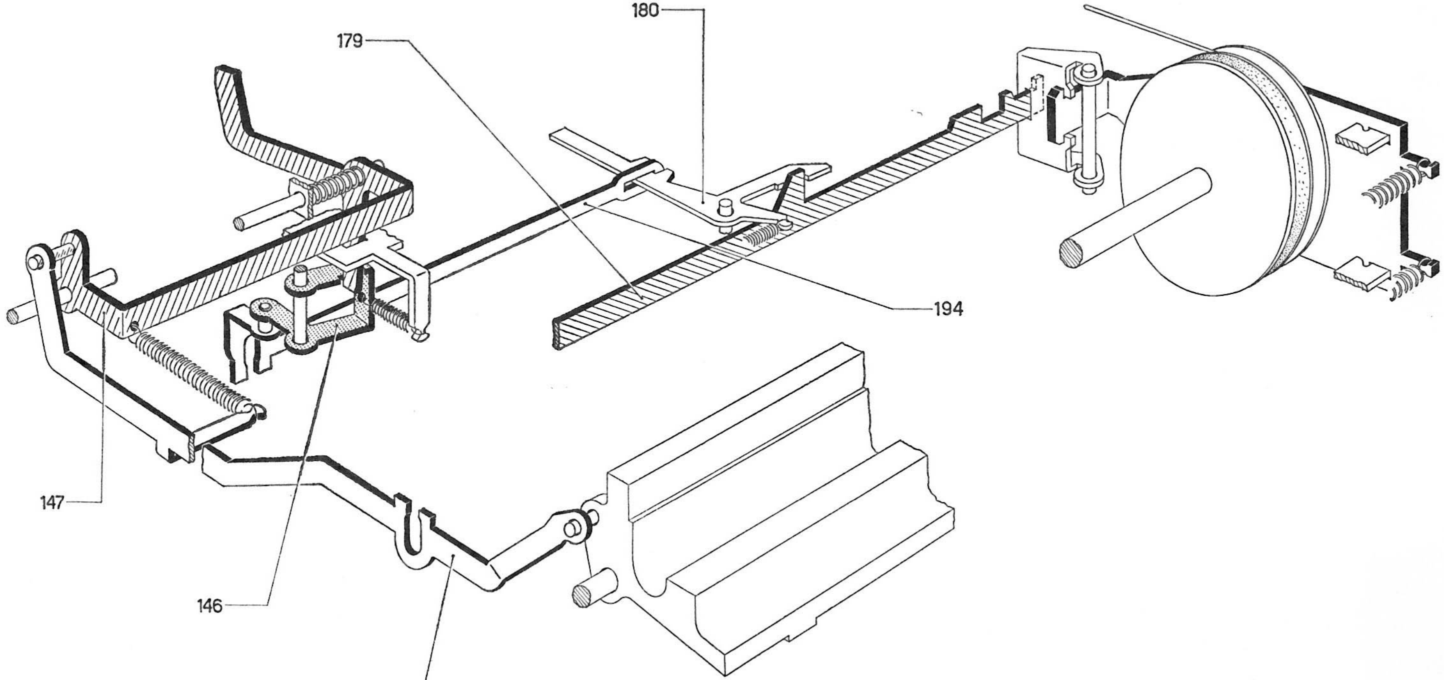
ADJUSTMENTS

1 - Figure 264

REVERSE TABULATION ADJUSTMENT

With the tabulator bar depressed, check the clearance of .3 to .5 mm. (.012″ to .020″) between the pull link latch and pull link as shown in figure 264.

To adjust: Open or close the adjusting slot of Link **194**.



265

RAPID MARGIN SETTING

RAPID MARGIN SETTING

Example **1** - Figure 266

- The left margin stop can be set very quickly and simply by the combined use of the electric margin key and the tabulator bar.
  - Assume the left margin stop is set at zero and three tabulation stops are set in the positions **A, B & C** as illustrated in figure 266.
  - To set the left margin stop to coincide with the tabulation stop set at **A**.
    - Return the carriage to the left margin.
    - Hold the electric margin key depressed.
    - Depress the tabulator bar.

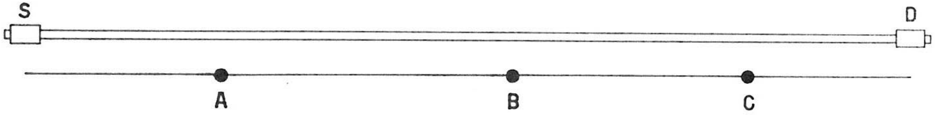
The left margin stop will then be brought to position **A**.

Example **2** - Figure 267

- Figure 267 shows the left margin stop in line with the tabulator stop at position **B**. To set the left margin stop at position **A**.
  - Position the carriage against the left margin stop.
  - Hold the electric margin key depressed.
  - Depress a carriage return key.
  - As soon as the carriage has passed position **A**, depress the tabulator bar.

The left margin stop will then be brought to position **A**.

266



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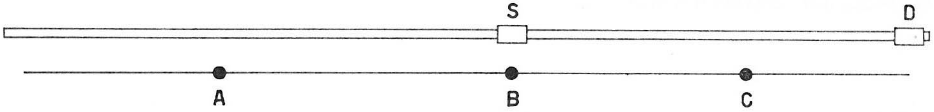


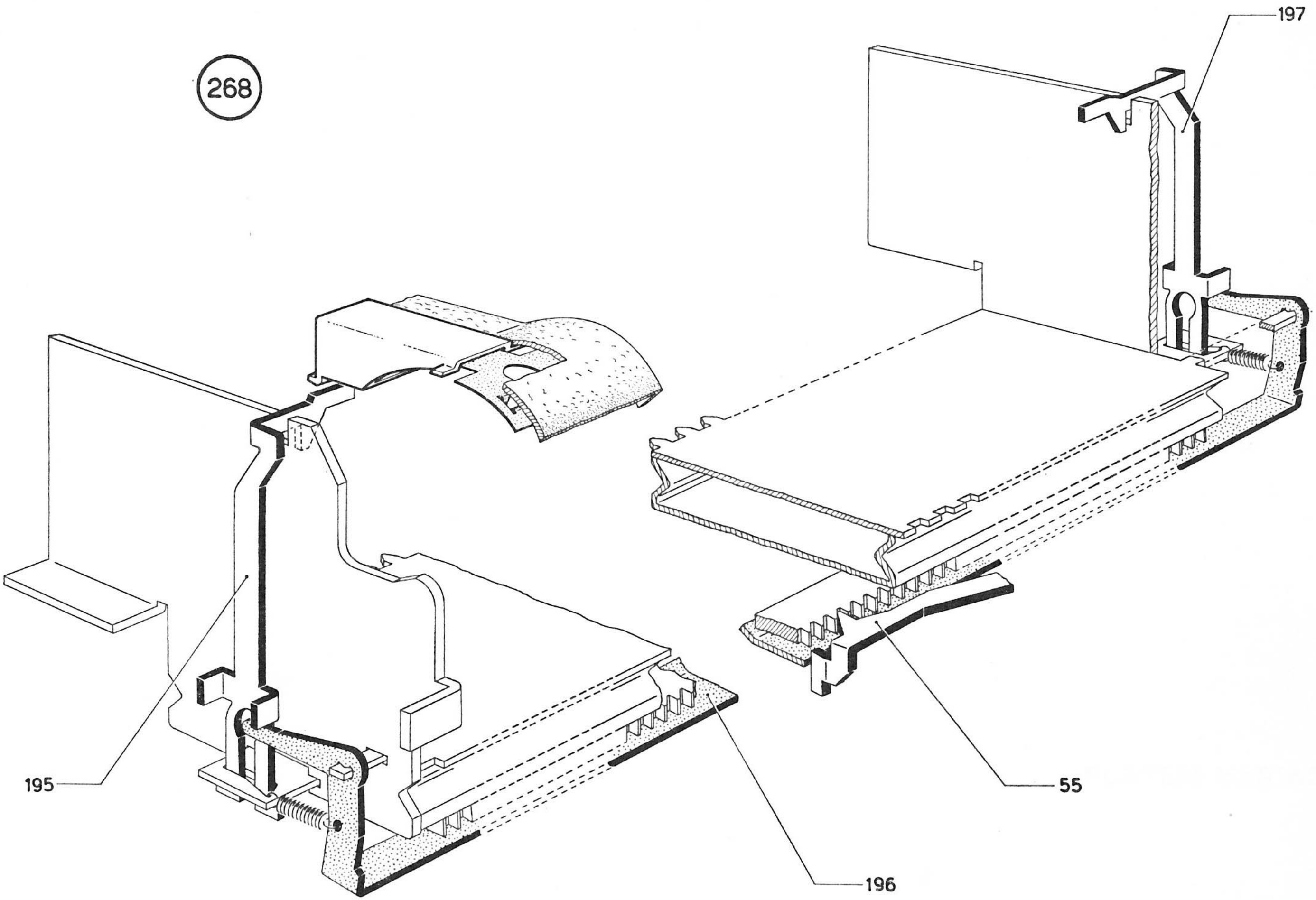
CARRIAGE RELEASE LEVERS

CARRIAGE RELEASE LEVERS

The carriage release mechanism is provided to enable manual positioning of the carriage without the interference of the escapement dog.

Depression of either carriage release lever causes Bail **196** to rotate, releasing the escapement dog **55** from the rack. The carriage can then be manually moved in either direction without noise.

(268)



PLATEN VARIABLE

PLATEN VARIABLE

The variable is a clutch device which allows the operator to rotate the platen independently of the line space ratchet. In order to release the platen from the control of the line space ratchet, the Variable Control Button 195 must be depressed. Use of the variable button enables the operator to choose a new starting point for line spacing.

ASSEMBLY

The Variable comprises the following basic groups:

- Platen connecting group, composed of the following:
    - Tubular Shaft **199**.
    - Platen Bushing **D**.
    - Left Platen Knob 198.
- Line space ratchet connecting group, composed of the following:
    - Clutch Shoes **202**.
    - Operating Levers **203**.
    - Cone **201**.
- Variable operating group, composed of the following:
    - Variable Push Button **195**.
    - Plunger Shaft **197**.
    - Compression Spring **196**.

In order for the three groups to perform their function, they are connected by the coupling pin **204**.

REST POSITION

- When the variable is at rest, the line space ratchet rotates with the platen. In this case, spring **196** forces cone **201** to the left, exerting pressure against operating levers **203**. This causes clutch shoes **202** to press against the platen drum (figure 271).

ACTIVATION

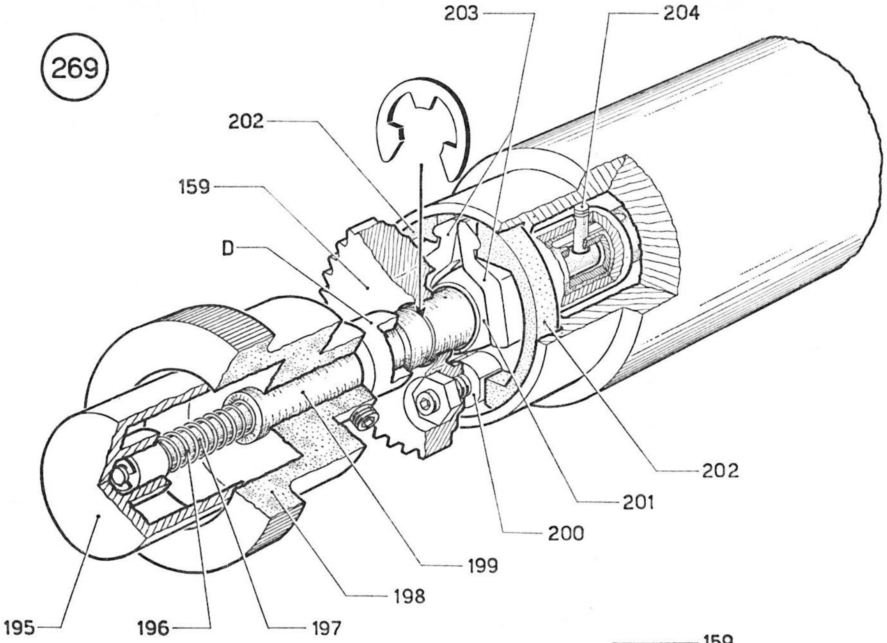
- When the variable push button is depressed, it moves cone **201** to the right releasing operating levers **203**. This in turn relieves the pressure of clutch shoes **202** on the platen drum (figure 272).
  The platen is then free to rotate independently of the line space ratchet, as long as the variable button is held in.

ADJUSTMENTS

The adjustment of the variable must provide a positive connection between the platen and line space ratchet when the variable is at rest.
They must also ensure that, with the variable operated, the platen is completely free of the line space ratchet.

To adjust: Reposition the eccentric **200** as required.

269



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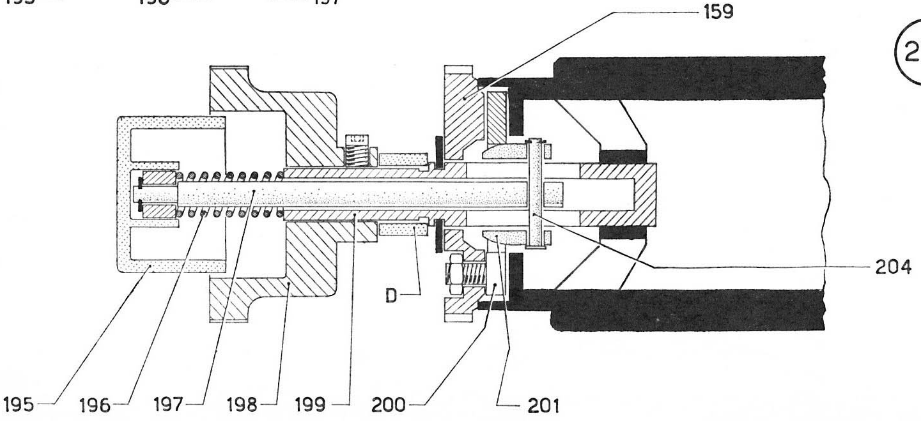

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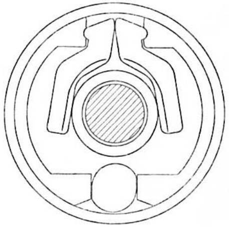
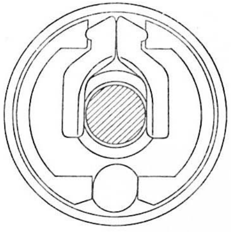




272

PAPER FEED - CARD GUIDE

PAPER FEED

In order for typing to print on a straight line, and successive lines to be parallel, the paper must be held in contact with the platen.

The control of the paper on the platen is obtained through:

- Feed rolls.
- Paper bail.

The relation of the feed rolls and paper bail to the platen can be controlled by the feed roll release mechanism. This mechanism allows the positioning of the paper after insertion and the removal after completion of the work. The paper trough **210** facilitates the insertion of paper in the machine by guiding it until picked up by the feed rolls:

- Feed Roll Release Lever **205** is assembled on the right side of the carriage and held at the rest by its spring.

In this position the Feed Rolls **208** and **209** will be against the platen together with the Paper Bail **211**.

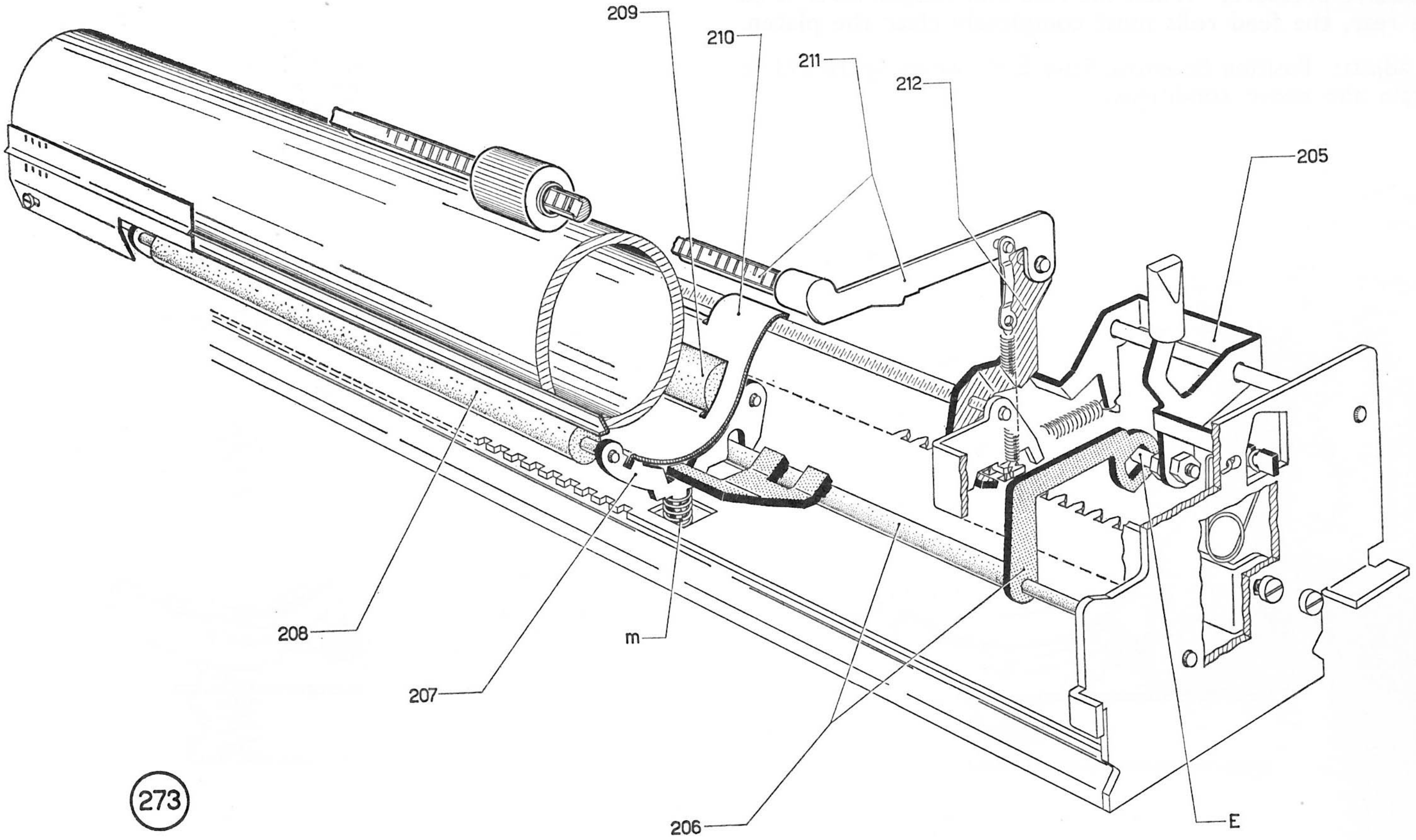
The paper will therefore, be securely held in contact with the platen both above and below the writing point.

When the feed roll release lever **205** is moved to the rear:

- Crank **212** will push the paper bail **211** away from the platen.
- Frame **206** will be rotated through the eccentric stud **E**, forcing down the feed rolls **208** and **209**, thus removing them from contact with the platen.

The paper can then be moved to the desired position.

When the feed roll release lever is restored, the feed rolls will hold the paper in its new position.



(273)

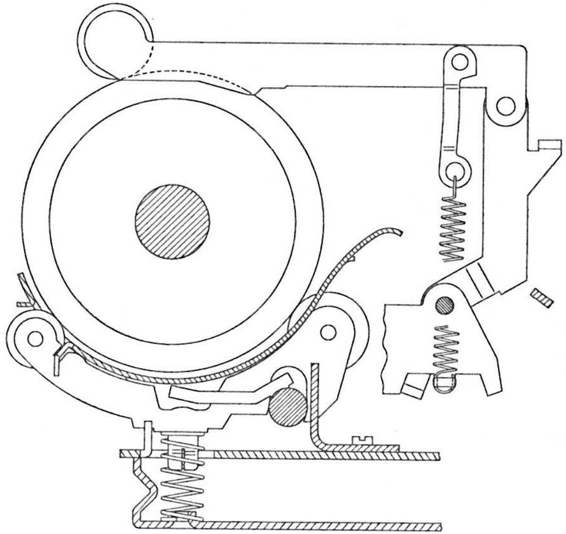
FEED ROLL RELEASE ADJUSTMENT

With the feed roll release lever forward, the feed rolls must firmly hold the paper against the platen without excessive pressure. When the feed roll release lever is to the rear, the feed rolls must completely clear the platen.

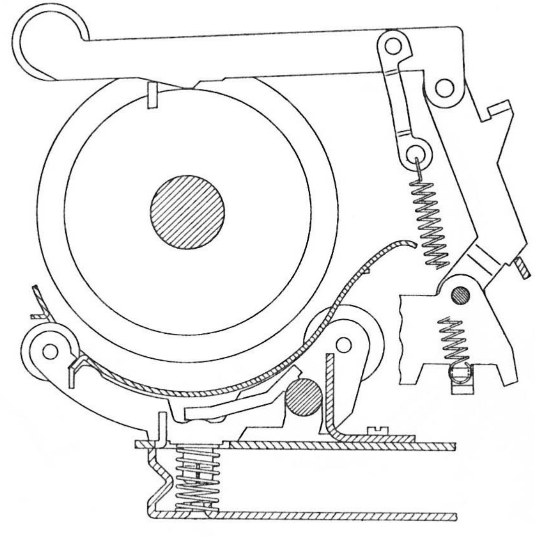
To adjust: Position Eccentric Stud **E** shown in figure 273 to obtain the above conditions.

Figure 274 shows the mechanism with the feed roll release lever forward. In figure 275, the feed roll release lever is to the rear and both feed rolls and paper bail are clear of the platen.

274



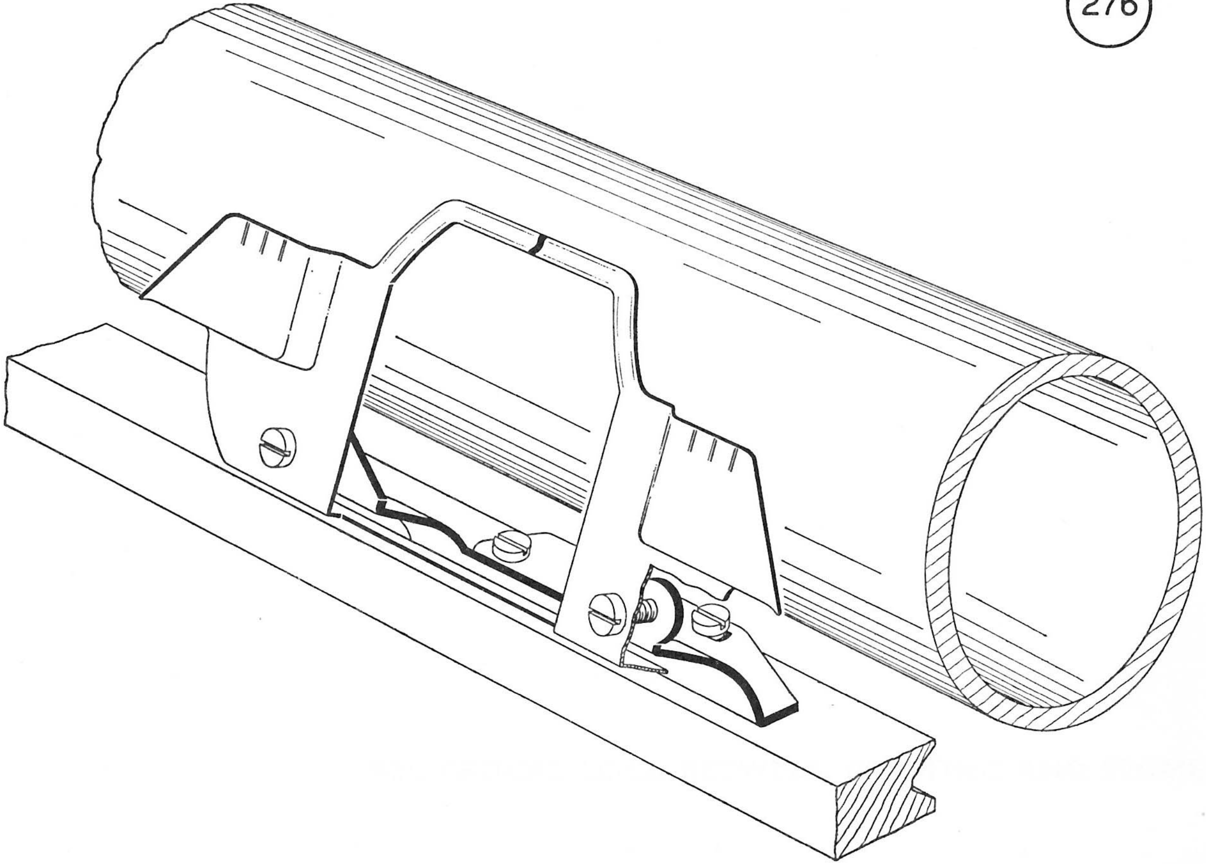
275



CARD HOLDER AND ALIGNING SCALES

Figure 276 illustrates the mounting of the card holder and aligning scales on the carriage with respect to the platen.

276



RECIPROCAL LOCK BETWEEN PRINTING AND SEGMENT SHIFT

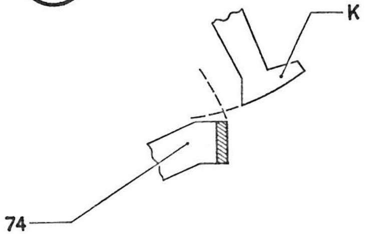
RECIPROCAL LOCK BETWEEN PRINTING AND SEGMENT SHIFT

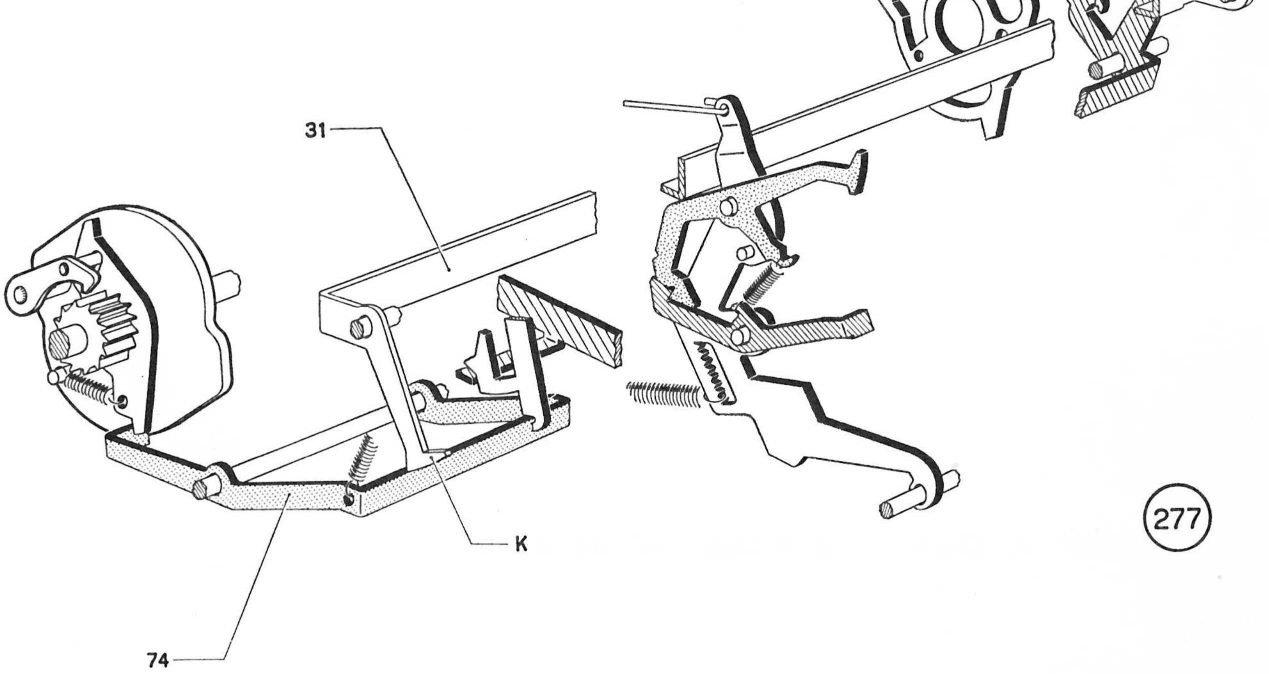
To prevent printing during a segment shift, a reciprocal lock is provided between the type action and segment shift mechanisms. This eliminates any possibility of " Flying Caps ".
The reciprocal lock makes it impossible for a type bar to rise while the segment is in motion.
Conversely, the shift movement is prevented during the printing cycle.
An action activated while the other is in operation, will be held in memory until completion of the first action.

— When the print activating bail **31** rotates during a printing cycle, its left extension K moves over the shift cam starting lever **74**.

Therefore, depression of the shift key releases the starting lever **74**, which is prevented from rotating by extension K of cam activating bail **31**, until the character has printed.
If the shift key is depressed before the character key, the shift starting lever **74** will be rotated in the path of extension K of the print cam activating bail **31**. In this position, the print cam activating bail is prevented from rotating and releasing the type action starting lever, until the segment has completed its movement. These movements are indicated by the dotted lines in figure 278.

278





277

ESCAPEMENT RACK AND MARGIN RACK - POSITIONS

ESCAPEMENT AND MARGIN RACK POSITIONS

The escapement and margin racks are positioned through a gauge and then pinned. New carriages have the racks already attached.

- Should it become necessary to replace one section of the escapement rack, the remaining section can be used as a reference for positioning the new one.
- The same procedure should be used when replacing both sections. Remove one section at a time, using the attached section as a reference for positioning the other.

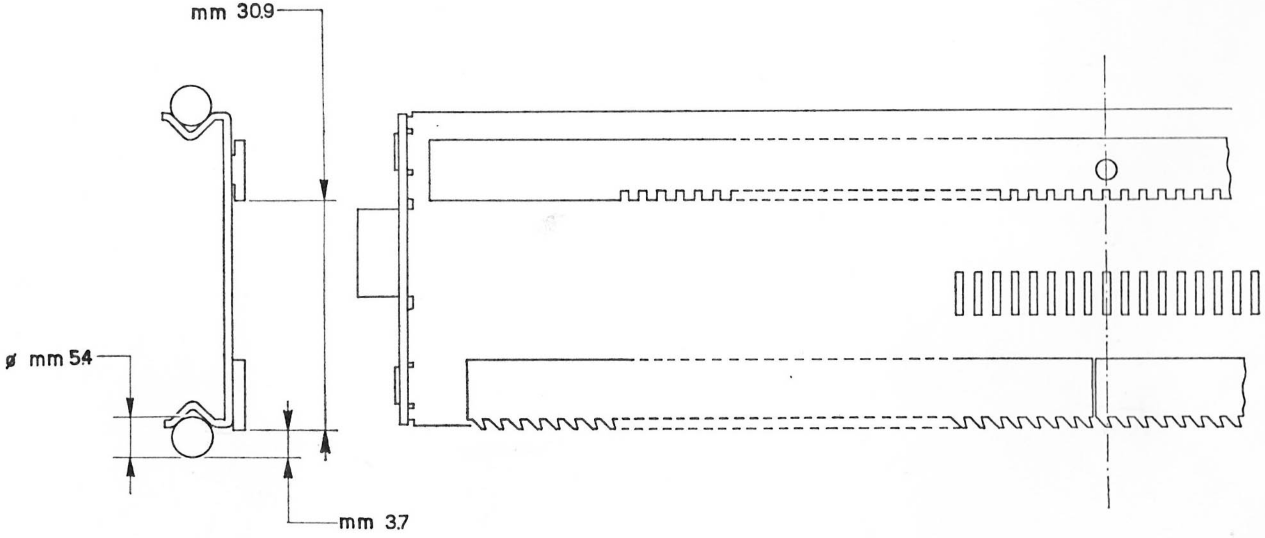
To facilitate positioning of the racks according to the dimensions shown in figure 279, a piece of rod 5.4 mm. (.213″) diameter should be placed in the front roll guide of the carriage.

The front edge of the teeth of the escapement rack must be 3.7 mm. (.146″) from the front of the rod.

The distance from the front edge of the teeth of the escapement rack, to the front edge of the teeth of the margin rack must be 30.9 mm. (1.217″).

It should be noted that the center screw of the margin rack must be perfectly aligned with the corresponding tabulation stop.

279



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